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NEWSPAPER

CW Photos by M. Upton

Nicholas Katzenbach, IBM counsel, and Thomas Barr, IBM lead attorney, (left) prepare to square off against Raymond Carlson and Joseph Widmar of the Justice Department legal team.

IBM Trial Begins This Week

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – After six years and 122 days, the U.S. government's massive antitrust case against IBM is slated to begin this week (May 19), barring last minute out-of-court maneuverings.

Last week both sides in the case and Judge David N. Edelstein agreed they were ready to start the oft-delayed trial without further delay.

In the case, the government is accusing IBM of monopolizing the general-purpose computer market through a series of practices designed to maintain a high share of the market and to keep competition at a minimum.

In the trial, which is expected to last as long as a year with a one- to two-month recess this summer, the government hopes to prove IBM has shown a pattern of conduct and actions intended to monopolize the computer business.

On the other side, IBM claims it is not large enough to monopolize any market since it has less than 40% of the computer business.

Furthermore, the firm claims the actions cited by the government are not illegal and therefore IBM should not be penalized for using them.

While the government admits some of the actions are not in themselves illegal, it does claim some of them are and, in any case, show IBM has monopolized the market and intends to promote and maintain that monopoly.

Claiming IBM has monopolized the systems market and the peripheral equipment and terminal markets, the government said it plans to show that dominance in a number of ways.

First, the government attorneys will rely heavily on statistics compiled internally

(Continued on Page 2)

AT&T Sets Up Council For Its Large Users

By Ronald A. Frank
Of the CW Staff

SAN FRANCISCO – AT&T has established a "Larger Users Action Council" to serve as a clearinghouse between large users and the Bell system.

The group was set up to provide a special focus on the problems of large Bell customers and expedite solutions, according to John D. deButts, AT&T board chairman.

In presenting the keynote speech at the annual conference of the International Communications Association (ICA) here last week, deButts said AT&T plans to introduce "a new order of network flexibility," Common Channel Interoffice Signaling (CCIS), which will be "a nationwide signaling network for long-haul calls that will be altogether separate from the talking path."

The first electronic toll-switching ma-

(Continued on Page 4)

Products Spark NCC Start

•Tesdata Shows CPE Monitor

By Don Leavitt
Of the CW Staff

ANAHEIM, Calif. – The MS series of minicomputer-based hardware monitors introduced here this week at the National Computer Conference by Tesdata Corp. appear to add several new dimensions to computer performance evaluation (CPE) for the IBM 370 installation.

MS – identified variously by Tesdata as "Measurement Systems" and "Management Systems" – is, for one thing, a family of devices. Users can start small and move up in power and flexibility as DP demands and equipment grows, the firm said.

There are nine models in the MS line, including variations of four basic configurations.

Smallest is the MS-38 with 18 to 36 probes, moving up to the MS-58 (36 to 72 probes) and then the MS-68 and MS-88 (72 to 144 probes). Plugboards

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•System Uses Seen Unlimited

By Patrick Ward
Of the CW Staff

ANAHEIM, Calif. – The technology seen in the past decade, not future technical breakthroughs, will eventually bring computer costs for the terminal user "somewhere in the range . . . of telephone service," two IBM scientists predicted at the National Computer Conference here this week.

"Decreased terminal and system cost and decreased functional cost to the user, will make computer services available to the local community, small businesses and the general public," Bernard J. Greenblott and Mu Y. Hsiao stated.

"In the context of access to the system via an interactive terminal, the potential for new aids to education, problem solving and decision making is almost limitless," they said.

The technological advances they refer to are in semiconductor logic and storage and in increased magnetic recording density.

These advances first made themselves felt in calculators, small computers and aerospace equipment, the speakers said, but engineering innovation and the solution of manufacturing and process problems will also carry them over to the terminal-based DP systems of the future, Greenblott and Hsiao said in a paper prepared for delivery at a session on "Future Prospects in Data Processing."

The two IBMers foresee DP systems consisting of intelligent terminals or other I/O devices linked to a CPU that has lower cost processor and storage functions and is physically much smaller than today's units.

Future trends will be toward "ratio

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Afips' Glaser Opposes Legislation Of DP Standards by Government

By Edith Holmes
Of the CW Staff

SAN MATEO, Calif. – "I would like to see the practitioners of our profession take the whole question of quality out of the hands of government, create and impose standards on themselves and let the public be the final judge of their appropriateness," George Glaser, current president of the American Federation of Information Processing Societies (Afips), said in an interview last week.

Expressing personal views that "are not necessarily those of my colleagues in Afips," Glaser noted both "the alienation of John Q. Public" as a result of the use of computer systems and the concurrent need for data processors to perform more than routine financial and security audits of their systems.

He added he is "basically opposed to using legislation" to deal with these and other problems facing DP.

But there are some areas where legislation certainly is needed, he indicated. Some privacy legislation, for example, "was appropriate and, presumably, we will all be better off because we have it," Glaser said.

But the alienation of the public – whether it's the housewife at the grocery store or the person who pays the monthly bills – that has been caused by computing is not best solved through this government or any government, Glaser maintained.

Identifying alienation as one of the chief social problems created as a result of the increased use of DP, he said, "I know some of the bills I get that are undoubtedly produced by a computer annoy the hell out of me. They're difficult to read; I don't understand their unexplained codes; I find errors without knowing how to go about correcting them."

But rather than rely on government "to fix" this common frustration, "I'm one of these guys who believes the marketplace will decide, penalizing those who conduct their business poorly and rewarding those who do it well," Glaser stated.

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Programmer, Manager Priorities At Odds in Reader Interest Poll

By Catherine Arnst
Of the CW Staff

The priorities of programmer/analysts and managers are radically at odds on certain issues, according to the recent *Computerworld* poll of reader interests [CW, April 16].

The poll was designed to gauge the level of interest among DP personnel on 14 issues (with 1 denoting the highest interest, 2 the next, etc.) and asked voters to check either management, DP manager, programmer/analyst or "other" as their job function.

The resulting patterns that emerged possibly show that the splits between labor and management in other industries also exist in the computer field, despite its more technical nature.

An example is the category of minicomputers vs. mainframes, widely favored as first in importance with every group except programmers, who placed it third on their lists [CW, May 14].

The movement toward distributed processing, a category sometimes closely linked to minicomputers, suffered the same disparity. Programmers ranked it low at 9, while the issue was given a 5 overall, 6 from DP managers, 4 from management and a high 2 from "others" (the "other" category was composed primarily of industry people and educators).

What programmer/analysts did consider most important was standards for programming languages, an issue closely aligned with their own performance on the job. This category ranged from middling to very low in importance with the other groups. It ranked seventh overall and for DP managers, fifth for "others" and got a 13 rating from management, the largest difference between two groups on any question.

Management's low level of interest in

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After Six Years, 122 Days

IBM Antitrust Trial Begins This Week

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has made to "impeach" those statistics.

Secondly, the government will use statements made by IBM officials and others in the industry, as well as independent industry statistical sources, to try to establish this monopoly position.

Sources of Visibility

The government claims IBM's market dominance can be seen in other ways besides the arena of statistics.

The first, the government has indicated, is IBM's power over prices in the relevant markets and the firm's use of pricing alternatives as a competitive weapon.

Citing the demise of General Electric and RCA in the computer business, the government next claims IBM has the power to exclude competition from the marketplace.

Further, the government said IBM has the ability to set de facto industry standards, which is a further indication of the firm's power in the market, and the corporation had unreasonably high profit levels further indicating that power.

The government then plans to show a pattern of conduct on the part of IBM that illustrates the firm's pursuit of its monopoly position and its efforts to maintain that position.

One of the major methods for this, the government said, is the use of bundled pricing which sets a standard for the rest of the industry, raising the price of entry into the computer market and excluding software companies from a large part of the market.

The government charges that, while IBM had incentives to unbundle earlier than it did, it chose not to unbundle in order to maintain the bundled environment and the resultant IBM advantages.

'Paper Machines'

The government also claims IBM has introduced "fighting machines," sometimes called "paper machines" because they are never built or delivered within the specified time.

In this case, the government charges IBM announced the 360/90, the 360/40 and the 360/67 just to knock out competition and not with any real expectation of delivering the systems as promised.

Another practice under attack by the government in the case is IBM's use of educational allowances which the government contends were used to forestall competition in educational institutions by ensuring graduates were familiar only with IBM equipment.

The trial opens this week with opening arguments from both sides outlining what each expects to prove in the case and how it will present that proof.

The government's case will begin with all the issues prior to 1969, the so-called "old issues" in the case.

Sometime, probably in July, the court will recess while depositions are taken on the issues of the peripheral equipment marketplace and on leasing – the "new issues." After the recess, the government will present its case on those issues.

When the government is finished – probably in late October or early November – IBM will get its chance to present its defense, which is expected to take longer than the government's presentation of the case against the firm.

Reciprocal Misconduct Charges Filed by Attorneys in IBM Case

NEW YORK – The IBM case is heating up in more ways than one, with lawyers for each side charging the other with grave misconduct in handling the case.

Judge David N. Edelstein has not allowed details of the charges to be released publicly, but last week he indicated each side has made "serious charges" that could affect the "professional standing" of the lawyers in the case.

So besides the normal tension surrounding the opening of a major case, an added ingredient of professional misconduct charges has been tacked onto this one.

While the details of the charges and countercharges are not yet public, it appears the issue revolves around a charge that a prosecuting attorney was misled into signing a document by an IBM attorney, sources close to the case said last week.

Apparently C.R. Esherick, a government attorney, signed a stipulation between the two parties last February.

Esherick reportedly claims he was told by an IBM attorney the stipulation had been cleared by Raymond Carlson, lead government attorney, the sources said.

On the other hand, it is believed IBM contends it did not mislead anyone in the matter and that the government is just making the charge to be able to get out of its obligations under the stipulation.

The charges are so serious that Edelstein, who is chief judge for the Federal District Court's Southern District of New York, plans to hold a hearing on the matter starting July 8.

While Edelstein stressed the charges would have no bearing on the antitrust case, he warned the lawyers the outcome of the hearing might well affect their professional futures.

High Court to Review Software

WASHINGTON, D.C. – The U.S. Supreme Court agreed last week to decide whether a software program for improving monthly bank statements can be patented [CW, May 14].

Arguments will be heard next fall concerning the lower court decision which upheld the application by Thomas R. Johnson to patent his software. The government, which sought review by the high court, contended that decision would have a "serious adverse effect" on the computer industry.

In ruling on this case, the Supreme Court could answer the question of whether any software is patentable.

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CRC Free Hasp Coding Changes Improve RJE Handling

By Don Leavitt
Of the CW Staff

CHICAGO – Computer Research Co. (CRC) has developed a series of coding changes to IBM's Hasp to improve the operating system extension's handling of terminals and other devices in a remote job entry (RJE) environment.

The Hasp performance improvement modification is available from CRC free to any installation asking for it, according to CRC software analyst Keith E. Moe.

Hasp (once known as the Houston Automatic Spooling Priority routine, but now just Hasp) manages the interfacing of tasks executing under OS and the peripherals and terminals they require.

In most situations with moderate numbers of devices, the system works fine, Moe acknowledged. But Hasp was sagging badly when faced with some of the huge RJE networks now under development by some users, the analyst added.

Working from an original suggestion from International Harvester (IH), Moe and his staff have reworked the mechanisms that control and scan the so-called Device Control Tables (DCT) within Hasp.

In measuring its IBM 370/168 with hardware and software monitors, IH found Hasp was taking some 30% of the CPU. That in itself seemed "not unreasonable" for the size of the RJE network involved, except that 70% of the CPU time was spent in one routine – $Getunit.

A study of Hasp's $Get-, $Free-, $Wait- and $Postunit mechanisms quickly showed why this happened. "Hasp was constantly 'waking up' processor control elements (PCE) $Waiting for a unit when no unit was available to satisfy the $Waiting PCEs. This meant long searches of the DCT chain for no good reason," Moe explained.

The command processor was also constantly searching the DCT chain during job and unit displays when only a small fraction of the chain needed to be searched, he added.

The DCT chain is made up of entries for individual devices, including indicators of which devices are available and information about how each device is accessed or used.

Hasp links these individual device entries into a long chain for easy handling. But the chains are organized by device type and scans always start at the top – even if the early devices are inappropriate for the task being managed.

The chain scanning has also conventionally failed to halt once the operation has passed through all the devices of a given type that are appropriate, he noted.

The modifications by CRC eliminate the majority of the searches of the DCT chain, since most of them are needless. The changes, for example, provide for the permanent acquisition of direct access DCTs by the PCEs that need that support, Moe said.

The "mods" also allow searching only that portion of the DCT chain that has the same type of unit as the one requested. This means both halting a scan after all acceptable units have been passed and jumping to the start of the useful part of the chain when the early entries are of no value for the immediate need.

A variety of other changes are included in the CRC modifications. The developer will make a copy of all the modifications available to any Hasp installation that wants it.

To receive a machine-readable copy of the code, users are asked to send an IBM "distribution tape reel" and a reusable mailer to Moe at CRT, 200 N. Michigan Ave., 60601, who asked that users note whether 800- or 1,600 bit/in. density is wanted. Please do not send a 1,200-ft or 2,400-ft tape reel, Moe pleaded.

Stronger Stand Urged To Defeat SCDP Bills

KENSINGTON, Md. – Although the Society of Certified Data Processors (SCDP) has lost the battle for state licensing of data processors in Massachusetts [CW, April 9], professional societies will have to take a more vigorous stance to prevent other states from passing "the persuasive yet premature" SCDP bill.

This is the warning in a statement from the Association of Computer Programmers and Analysts (ACPA), which favors voluntary certification.

The SCDP has tied licensing in with "the federal privacy bandwagon" to create "a neat little package" for state legislators, the ACPA stated.

In documents it has sent to legislators, the SCDP has been making the point the passage of privacy laws ought to be accompanied by the creation of a corps of "bonafide licensed computer professionals" to make sure the law is being observed, the ACPA said.

For example, the SCDP's "Statement of Legislative Intent" regarding licensing stated "The concern of the privacy of data subjects has become prevalent throughout the U.S. . . . As states enact such legislation, it will be necessary to establish mechanisms to ensure compliance with such statutes, to ensure the rights of the citizenry are protected.

"Such mechanisms should include persons knowledgeable in the practice of information handling. Such a person, we feel, is the licensed professional data processor."

ICCP Responsibility

The SCDP and other Institute for Certification of Computer Professionals (ICCP) constituent societies ought to leave the issues of certification and licensing to the organization they created to deal with them, ACPA stated.

The ICCP, in turn, should reassert its responsibility here.

The ICCP must act immediately to ensure there is an appointed representative at all legislative hearings – "at least until documents and materials are prepared to assist in that purpose."

Unionization Possible

One reason to avoid mandatory licensing, ACPA indicated, is that it "could very well evolve into complete national unionization of various levels of DP practitioners."

A dissident group of DPers could evolve around an issue like this, ACPA suggested. "The evolution to unionization from licensing could possibly become a real threat to areas of this country," ACPA stated.

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But Approves Some Legislation

Glaser Opposes Government Imposition of Standards

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"Sure, that may take time and, in the short run, some people are going to get poor treatment. I wish that weren't the case. But eventually, people will elect to do business with firms that treat them well," he said.

He urged those businesses using and marketing DP to make an active effort to create systems the public can trust. "I would like to see our profession lay down some quality standards and say to all practitioners of DP, 'Hey you guys, you're just going to have to do better.'

"Then the public can decide if the system is both well-conceived and well-executed by evaluating the product it turns out."

Indicating the ability to control systems adequately requires considerable study, Glaser noted he represents Afips on the advisory panel to the Institute of Internal Auditors (IIA) which is currently attempting to delineate the problems of "system auditability" [CW, April 9].

"I am only just beginning to understand these problems myself. Such a study is badly needed, and I hope it moves swiftly," he said, "because a great many of the people designing systems today have no idea how serious those problems are or how to deal with them."

Glaser stressed that he included audits of all kinds, not just those of physical security and financial integrity, although these are essential.

"I'm talking about any audit that produces some reassurance the system is working, transactions are legitimate and accounts are in order," he said.

"It's important to understand we're not always talking about someone stealing something; we're talking about abusing some poor guy who's an innocent bystander and a victim of our own poor design or lack of control," he explained.

Such abuse "is not so much cavalier as it is inept," Glaser added. "But we shouldn't permit it to continue, and the customer's reaction to that kind of treatment won't allow it to go on."

While he emphasized the need to study the related problems of alienation and adequately controlled systems, Glaser said, "I, for one, am not willing to study the subject forever with some naive hope that someday, when I finally get around to taking action, I'm sure I won't make a mistake.

"I don't think life is that kind to us – time passes too quickly. There's no conceivable way for us to anticipate all the consequences of everything we do. We must spend time thinking out the implications of our actions, but it's an incomplete job by definition," he added.

While some government action may be of help or even necessary in some instances and a certain amount of study should be done, Glaser concluded it is essential to get rid of the negative image people can have of computing.

"We have a difficult job on our hands to dispel the antagonism or apprehension that has been rather widely created in the eyes of the general public.

"This does not mean teaching the public Fortran, but it does suggest we understand better the role human behavior plays in the success of what we do," he said.

Large Users Council Established by AT&T

(Continued from Page 1)

chine with CCIS will become operational early next year in Chicago, he said. The economies of CCIS will produce "faster set-up times and addressing flexibility" and it will afford customized services on a common user basis, he told the conference.

Service Versatility

The needs of communications users can no longer be met with standardized service offerings, deButts said, and the Bell System will implement a policy of service versatility in the years ahead.

"No two customers are precisely alike," he said. Specialized attention to the specialized needs of communications managers is at the top of the Bell System's priority list and that is why marketing emphasis has been increased in each of the Bell operating companies, he said.

Turning to AT&T's opposition to competition, deButts said "we believe it works to the disadvantage of the average user" and Bell is determined to fight it. Although the Federal Communications Commission (FCC) has a doctrine of equal competition with the same ground rules for all carriers, "this has not been our experience."

He cited the year or more that AT&T had to wait for approval to introduce its high/low rates for intercity private line services and the current FCC requirement that AT&T charge higher rates than it wants to charge for its Dataphone Digital Service as examples of unfair competition.

The Bell opposition to competition is not based on a desire to protect AT&T markets and AT&T profits; instead it is based on the fact that fragmented responsibility for service would impair the quality of the service and increase its costs. When that happens, AT&T will "oppose it as vigorously as we know how," deButts said.

Membership Limited

Describing recent policies set by ICA, Martin Fullerton, ICA president and manager of communications services at Alcoa, said the user group has decided to limit the number of member companies at 360. At present ICA has 354 member companies with 901 members and, when the 360 limit is reached, a waiting list will be established, he said.

The user organization has decided to temporarily dissolve its regulatory subcommittee "until more thorough and acceptable guidelines" can be established. As a result of contact with the ICA, overseas telecommunications associations have been formed in Great Britain and Switzerland, he told attendees.

Everybody knows what tomorrow's computer system will be like.

It will serve all kinds of commercial and scientific users (local and remote batch, time-sharing, real-time, transaction processing) concurrently and interactively with no discernible delays.

It will handle a great variety of unscheduled jobs in the most efficient, cost/effective way possible.

It will be able to manage a very large shared data base.

It will allow each kind of user to communicate with it in the simplest and easiest language suited to his task and his level of expertise, and it will let programmers develop and debug on-line, then immediately put their completed programs into production.

It will automatically keep track of priorities, shifting them about as deadlines approach or if real-time urgencies preempt segments of the system.

It will have self-scheduling hardware to dramatically reduce software overhead and speed up execution.

It will have a control processor to manage the entire system, another processor dedicated to computing, and multiple processors for input/output.

It will have an operating system that is completely transparent to the user and which will see to it that all units are kept as busy as the workload demands, up to nearly 100% system efficiency.

It will have independent memory management with virtual addressing.

It will converse with other manufacturers' computers and with intelligent remote terminals.

It will have close to 100% availability, diagnosing and isolating its own ailments and working around them until they are corrected.

It will be modular so that capacity can be precisely fitted to current needs and can later be expanded simply by adding more units under the control of the original operating system.

Panelists See Unlimited Uses for Future Systems

(Continued from Page 1)

improvements of 40 or even greater in the cost reduction and volumetric efficiency of storage systems," Greenblott and Hsiao said.

Large-scale integration (LSI) has also made it possible to incorporate more storage and logic capabilities into terminals, the speakers said.

Microprocessors Economical

The semiconductor manufacturers who set the adding machine world spinning soon found they could build simple computers too, according to Univac's James C. Nelson, speaking at the same session.

Computer design engineers will try to use these microprocessors whenever possible because of economics, he said.

Nonintelligent peripherals will be an extinct species in the near future, he said. Routines previously held in the central processor for peripheral unit control will gravitate over to a microprocessor in each peripheral that will control its function and allow for changes in control disciplines, Nelson said.

Microprocessors will generally minimize the actual control of processes by large-scale CPUs, he said. Instead, the big machines will specialize in network control and data base handling, he predicted.

There will be attempts "to partition complex problems with little data base overlap so a pipeline of microprocessors" can deal with them more economically, Nelson added.

There will also be a fallout among semiconductor makers, leaving several firms concentrating on specialized markets, he said. For better or worse, this will give rise to de facto standards in microprocessor interfaces, Nelson stated.

How will these technical changes affect the operations of future computers? A trend from batch operations to interactive concepts that project the resources of the computer directly to the user is already evident, according to another speaker, Frederic G. Withington of Arthur D. Little, Inc.

"Remote data entry, remote batch processing, conversational program development, transaction processing and (in general) the association of integrated data bases with the organization's employees at every level have achieved general acceptance," he said.

Virtual system management, data base management software, improved communications processing subsystems and self-diagnostic and remote maintenance capabilities have helped to make this possible. All reduce and sometimes nearly eliminate the need for operators in the computer room, Withington said.

Manufacturers now face the responsibility of providing foolproof software that won't fail under any combination of permissible actions by the user. It also must provide all the audit trails, journals and control reports.

The computer operator's primary responsibility "used to be the application of system resources to every individual job," a role which has disappeared altogether, Withington said.

Instead, the operator is changing into "the custodian of the information resource," Withington said.

He must see to it analyses are performed regularly to account for usage and to keep track of developing maintenance and bottleneck problems.

"He must also . . . see to it that the control and backup procedures are adequately followed, that no illigitimate access to data is occurring via routes . . . he can monitor, that the appropriate journals of transactions and file images are maintained and safeguarded and that, in general, all control procedures which require regular execution are followed."

Tesdata CPE Monitor Works at 370 Sites

(Continued from Page 1)

extend the hard-wired logic available on each system, Tesdata noted.

Each configuration has an Interdata mini at the heart of the system. The MS-38 may have 8K or 16K; the MS-58, 26K or 32K; and both the MS-68 and MS-88, 32K.

Peripherals include CRT display consoles, a gas plasma display unit and either a character or line printer. Disks provide the media for capturing the measurement data.

While all this is probably more equipment than has been available with a hardware monitor before, it is the way the mini within the system is used that really makes the MS series different, Tesdata said.

Up until now, minis in monitors have been used to speed up or control the data collection phase of CPE. With MS, the mini and the Tesdata software can handle the data reduction and report generation phase as well.

The Data Reduction Software (DRS) provides required information, in readable formats, for specified periods, all under direct user control. The variable format reports present data in graph or tabular forms.

By having the report generation capability immediately available, DRS allows the user to see what is happening while it is happening, not some time later when it is too late to take corrective action.

In that same vein, the availability of the gas plasma display – with 16 vertical bar graphs of 200 digital segments each (therefore a .5% resolution) on any measures the user wants displayed – provides an immediately readable report of an on-going situation, a spokesman noted.

Software logic supporting Kiviat graph output in the CRT carries this emphasis on "getting the picture across" one step further, he added.

The DRS is available in three forms. The Host Analyzer executes on a host computer after all the data has been collected on the MS unit. This approach, which uses 140K of memory on the mainframe, allows several more report options.

Both the Mini-Processor Analyzer (MPA) and the Mini-Summary Analyzer (MSA) forms run on the Interdata mini within the MS.

The MS units are being marketed primarily on a three-year basis, ranging from $875/mo for the MS-38I and $1,275/mo for the MS-38II up through $3,875/mo for the MS-88I and $4,575/mo for the MS-88II.

On a five-year plan, the MS-88II is priced at $2,975/mo, Tesdata sources noted from 7900 Westpark Drive, McLean, Va. 22101.

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Programmer, Manager Interests Diverge in CW Poll of Readers

(Continued from Page 1)

standards could be inferred to show an attitude of "I don't care how the job gets done, as long as it's done" among upper management levels. Those levels are possibly too removed from the actual operation of the DP shop to feel affected by this issue.

Licensing Issue

Another category programmer/analysts ranked high was the controversial "licensing of computer people" issue. They rated it fourth, while it was ninth overall and for management and DP managers and ranked 11 by "others."

It's thought programmer/analysts rated licensing as high as they did because they compose the group most directly affected by the issue. The low interest among "others" is in line for the same reason – the issue touches them very little, if at all.

An area ranked low by programmer/analysts as compared with the other groups was vendor support and enhancement of operating systems. Management and DP managers rated this category third and fourth respectively; it received a 7 from programmer/analysts and 8 from "others." Here, the reasoning used by the different groups on standards is probably reversed – while vendor support is of relative importance to management because it ensures the system will continue to operate at its peak, programmers are less concerned.

Communications Fare Poorly

Communications also fared poorly with programmer/analysts. There were two categories in this area: future communications options, such as all-digital nets and satellite service, and the conversion from batch to on-line systems. Batch to on-line was rated second by management and DP managers, while with programmer/analysts and others it was fifth and sixth, respectively.

As for future communications options, the issue was ranked low by all groups – it got an 11 overall and from DP managers, 10 from management, 12 from "others" and 13 from programmer/analysts. The slightly higher interest among management could connote it is keeping track of development in this field with an eye toward eventually converting their own operation if it becomes practical.

An area lacking in interest from management was the training of DP people. It ranked fifth with them, slightly lower than the 2 it received overall and from programmer/analysts and 3 from DP managers and "others."

DP managers varied most from the other groups on budget reductions. They gave this timely issue a ranking of 5, whereas it was eighth overall and for management, received a 10 from programmer/analysts and 13 from "others." Managers' concern in this area concurred with a CW survey of DP managers on the subject of budgets at the end of 1974 [CW, Dec. 4], in which over half of those surveyed reported their increases would be under 10%, lower than the current rate of inflation.

IBM at Bottom

All categories involving the industry giant, IBM, fared poorly, with the "other" category showing a slightly higher level of interest than the others. Future IBM products after the 370 line ranked the highest, receiving a 4 from "others," 7 from management, 8 from DP managers and 10 from programmer/analysts.

The government's antitrust action against IBM and its possible effects gained a consistent 12 from all categories except "others," which ranked it 10, and IBM's entry into the satellite communications area gained a large yawn from all groups – it was unanimously ranked last.

There were two categories dealing with issues affecting the public, and both fared poorly. Possible privacy regulations on private data banks garnered a rating of 6 from management and programmer/analysts, 7 from "others" and 8 from DP managers.

This rather low level of interest within the computer industry is certainly at odds with the general public; a Louis Harris poll last year showed 75% of Americans are in favor of legislation controlling data banks [CW, Sept. 11].

The consumer problems created by electronic funds transfer systems and the Universal Product Code ranked even lower – this issue garnered a 13 overall and from DP managers, and 11 from management and programmer/analysts.

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Gay Task Force Says IBM Policy On Hiring Homosexuals 'Positive'

By Edith Holmes
Of the CW Staff

NEW YORK – IBM is among those firms that have responded positively to an inquiry by the National Gay Task Force on corporate willingness to hire and advance people who are homosexual.

In a survey of 86 major U.S. corporations, the Task Force said IBM was among those companies that do not discriminate in hiring and firing employees on the basis of sexual orientation.

"We don't ask potential employees about their sexual orientation," Jerry Anderson, in charge of employment for IBM, said. "Off-the-job behavior is not a concern of the company unless it affects performance or IBM's reputation."

Anderson stated this attitude does not represent a change in policy for IBM. "We've always considered sexual orientation a very personal matter and not a topic we would initiate in an interview for employment," he explained.

'More Successful' Responses

While the Task Force considered IBM's answer to its letter on employment practices "positive," a spokesman for the group indicated there were some responses that were "more successful" from a gay point-of-view.

"More successful" in this instance means that a corporation has made its attitude toward sexual orientation a matter of policy, he explained.

"Not only do we want to make it possible for openly gay women and men to secure and hold employment, but we would also like to offer peace of mind to gay people already employed and afraid of discovery," the spokesman said.

He cited the letter from AT&T as an example of a clearly affirmative statement. Speaking for the corporation, Board Chairman John de Butts said "the American Telephone and Telegraph Company's publicly enunciated policy barring discrimination against homosexuals in hiring and employment is as follows: An individual's sexual preferences are not criteria either for becoming an employee or remaining an employee of the Bell System.

"Job retention and promotability are based upon demonstrable job performance and behavior. An individual's sexual tendencies or preferences are strictly personal and information about these matters should not be sought out by company personnel."

Honeywell, Xerox in the Middle

Honeywell and Xerox were the other two computer companies included in this initial survey. Neither company ranked with IBM in the Task Force's evaluation, according to the spokesman.

"We couldn't classify their statements as positive, but then that doesn't mean they were negative either," he said. Both Honeywell and Xerox indicated that discrimination on the basis of sexual orientation was a matter of corporate concern, that it had been discussed and that their intention was to eliminate such discrimination. For the moment, however, no public statement of policy should be expected, the two companies said.

"Because IBM's attitude is also not a matter of *public* policy, some of us on the Task Force can have a difficult time arguing that corporation should be on one side of the positive line while Honeywell and Xerox are on the other," the Task Force spokesman said. He acknowledged the weight given to the wording of letters sent to the Task Force and the fine distinctions that were made as a result.

Yet, because areas like sexual orientation are usually sensitive, people – and companies – tend to be careful in the words they choose to express their views, he added.

"No response received has been negative," the spokesman noted. "And in several cases, companies have said they would develop public policy statements if Congress passed a law requiring them.

"These comments are helpful to us in our efforts to convince legislators that the civil rights laws need to be amended," he said.

Of those firms surveyed that responded with a public statement, the spokesman said they are generally recognized as examples of good management and the Task Force hopes their attitude will lead the way for change in other, less prominent firms.

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Isolates Trends Quickly

Interactive Graphics Help Doctors to Correlate Data

By Edith Holmes
Of the CW Staff

BOSTON – Physicians faced with the familiar problems of correlating massive amounts of data to make an initial diagnosis and then a sequence of therapy decisions may have an aid in interactive computer graphics systems.

Graphic presentations of the history and present condition of chronically ill persons can often help physicians isolate trends more quickly than they could by manually assessing raw data, Dr. Lou Katz, senior research associate in the Cancer Research Center at Columbia University and adjunct associate professor of graphics, told a meeting of medical and DP personnel here recently.

At Columbia University, a medical team headed by Katz uses a Digital Equipment Corp. PDP 11/45 and Tektronix graphic terminals to access graphic presentations of the history and present condition of some 100 chronically ill persons. Eventually, the system will contain over 500 patient data files, Katz said.

Data available through the Computer-based Case Tracing (Comptrac) system developed at the university can include the results of laboratory tests, diagnoses and medication and therapy information.

The information is output on either a Tektronix 4012 or one of the company's 4010-1 graphics terminals. Physicians may obtain hard copies from one of two 4610 hard-copy units by the same vendor, Katz noted.

Physicians access patient records through the terminals via dial-up lines using 1,200 bit/sec modems. System programming is in the high-level language of "C," an Algol-like language developed by Bell Laboratories, he said, adding that it requires little core – only 15K PDP-11 words. The mainframe has 40K of core and 40M bytes of storage capacity.

Patients' Histories

Patients' histories are retrieved as one display with several graphs, Katz stated. The plot of the therapy administered is shown in the center of the display for easy reference to those variables which suggested and continue to be related to treatment. In addition, doctors' notes, short prose comments, are listed at the bottom of the charts.

Any one of a number of conditions can be graphed, according to Katz. The current operational data base at Columbia contains the records of individuals suffering from a specific type of cancer, multiple myeloma, but illnesses from hypertension to diabetes can also be accomodated in graphic form by this system.

One or several medical problems can also be plotted on the single display, Katz added. The formatting of this information is specified by the physician and can be table-controlled.

Should doctors have difficulty obtaining the information, they need only give a "HELP" command to receive instructions on how to use the system, Katz commented.

Data can be charted for any time period required by the physician: over the entire course of the disease or for the most recent few months. Katz explained it is also possible to request the records of those patients who have undergone similar treatment, to compare cases and to obtain expanded plots of critical periods.

Updated data is keypunched into the system by technicians operating from remote terminals, he said. While such updating isn't a problem for the system, Katz indicated this function does tend to be slow simply because the system's primary purpose is retrieval.

Capable of servicing several physicians and several patient populations at once, the retrieval system is relatively inexpensive in a shared environment, he said.

In addition to adding the treatment records of other chronic illnesses to the system, Katz indicated Columbia hopes eventually to make long-term clinical information graphically available to doctors who may be continuing treatment after a patient transfers or develops other medical problems.

CW Photo by E. Holmes

Dr. Lou Katz

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New Hampshire Sen

By Patrick Ward
Of the CW Staff

CONCORD, N.H. – The New Hampshire legislature is considering a bill that would make it unlawful for anyone "to practice or offer to practice data processing unless he holds a valid certificate of registration."

Senate Bill 282 closely resembles similar bills that the Society of Certified Data Processors (SCDP) has sent to state legislatures. Sen. D. Alan Rock (D-Dist. 12) said he sponsored the bill as a favor to interested constituents, without being especially familiar with its contents.

Although the bill arrived too late for this session, the Senate Ways and Means Committee has decided the measure is worth considering. An interim study committee will review it until the next legislative session.

If passed, the bill could take effect as early as July 1, 1976.

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The Unanswered Question

Internal documents from Teletype Corp. make it clear the Model 40 display terminal is much more than a teletypewriter replacement. (See related story on page 23.)

The documents specify the capabilities of a binary synchronous CRT terminal that can operate at 2,400- and 4,800 bit/sec with a clustered configuration using IBM 3270-type software compatibility.

Those type of specifications are normally found in IBM documentation instead of Bell System documents. Officially, AT&T admits only that it is considering new speeds and new features for its display, but spokesmen are quick to point out no decisions have been made.

A computer-compatible clustered terminal from Bell raises once again the question of whether the local phone company will soon be a supplier of DP terminal equipment.

When the Model 40, or Dataspeed 40, as the phone company calls it, was first introduced, AT&T went out of its way to proclaim this was merely an upgrade for the aging teletypewriter. But the new Teletype documents clearly show capabilities specifically designed to meet the requirements of teleprocessing users.

It is nonsense for AT&T officials to say they have no plans at this stage of the game. When will AT&T become a terminal vendor? Users, competitors, the Federal Communications Commission and the Justice Department are waiting for an answer.

Letters to the Editor

Dichotomy of CW Attitude On Minis Unjust to Users

I am quite upset by the obvious dichotomy in *Computerworld*'s attitude toward the minicomputer world. First, CW has Herb Grosch, who romanticizes the courage of the minicomputer programmer and the beauty of his product and adjures all to follow his lead.

On the other hand, CW runs any number of articles about minicomputers, apparently written by a fringe group which seems to feel minis are intractable little beasts made to work only by vast drudgery.

Even more disturbing was CW's apparent acceptance at face value of the article in the March 19 issue, "College Converts to 7/32," in which Michael O'Heeron basically seemed to say he had installed a minicomputer that didn't work, wouldn't work, never was going to work and would only be satisfactory after his (impending) immediate upgrade.

Yet he felt so strongly he had been justly dealt with by the machine's vendor and that he had achieved his goals, he subsequently wrote a letter defending his "testimonial" and reiterating his satisfaction [CW, April 9].

O'Heeron is an extreme case and can probably be discounted. But CW does many of us working with minicomputers an extreme injustice by lending editorial authority to tutorial articles which proclaim the difficulty of working with small machines.

In truth, there are a great number of us out here who are extremely comfortable with our minicomputers.

In the particular case I represent, Data General Corp. gear, we can have CPUs which are reputed to be in the same power range as the IBM 370/155, peripherals such as 3330-type disks, and operating systems such as Data General's RDOS which I believe to be in the same class with practically any big-machine operating system (except easier to use and more reliable).

Small machines are, if anything, easier to work with than big machines.

L.F. Wygant
Schiller Park, Ill.

That Feeling of Security

G.H. Barger's letter in the April 23 issue just has to be commented on. It is indeed refreshing to hear from a user who clearly has a clean, simple understanding of the computer industry and American business in general.

Certainly, several things may be assumed about Barger based on his philosophy of "biggest is always best" or "might makes right" (if I may take the liberty of paraphrasing).

That is, I am sure he drives a Chevrolet (largest selling car in America), always flies United Air Lines (most popular carrier) and wouldn't think of dining anywhere else but at McDonald's. In fact, I suppose we can even be pretty safe in predicting Barger will never visit the cities of Detroit, Cincinnati or Dallas – because if God had meant for him to go there, surely United Air Lines would have the route.

Life would be so simple if we each had a mental discipline as clear as this man's. Who needs competition when you consider all the confusion and decision making that must result?

I really only have one question. May we also assume that the reference to Paterson, N.J. points only to Barger's location of work? Surely he must reside in neighboring New York, a bigger (better) state where, no doubt, the higher cost of living is more than offset by the feeling of security one gets there.

C. Shammi Jenkins
Los Angeles, Calif.

Grosch Risks Reputation

Herb Grosch risked his reputation as an iconoclast by sermonizing on the immutable laws of computer architecture [CW, May 7].

My letter to *Datamation* did not propose the abolition of program storage, but simply its separation from data storage. The reason for this proposal was not theological but economic. Programs and data require different storage capbilities; their separation should save money.

Nothing in this proposal foreclosed the full power and richness of programming languages. It does not prevent the hardware designer from specifying a machine language as primitive or as sophisticated as he pleases. Nor does it prevent the programmer from exploring the dark recesses of bit manipulation or from building higher level languages ad infinitum.

There is no need to wake the ghost of Babbage over a misunderstanding. I have been programming since 1948 and I do not expect to be replaced by hard-wired programs, before or after 1984.

Stephen E. Wright
Princeton, N.J.

'One of the Good Guys'

Herb Grosch has seriously misinterpreted a point made by my old friend Steve Wright.

Wright's point in his *Datamation* letter was that by 1984 there will be no need – if there is now – to store data and instructions in the same medium.

Since self-modifying programs should be avoided – even now – there is no reason not to save money by putting instructions in a separate fast-read, slow-write storage.

Such a computer would still have its own machine language, applications programs and all the rest of it.

Perhaps the confusion is that "stored program" has long been used loosely as a synonym for "self-modifying program." Indeed, Wright's letter almost reads that way. But the rest of the letter makes it clear he is objecting not to the storage of programs per se, but only to the rigidity of storing programs and data together.

Relax, Grosch. Wright is one of the good guys.

Daniel D. McCracken
Ossining, N.Y.

Herb Grosch replies: "I used the term 'stored program' primarily in the sense of self-modifying capability, since prospective drastic reductions in storage cost make the economics argument secondary."

Article Misses Key Point

The April 30 article, "Chargeback Schemes Allow Users to Evaluate System," seems to completely miss a key point.

Chargeback systems (on any basis) can only be successful as one of two distinct functions:

- An accounting tool for zeroing in on DP costs, therefore reflective of accounting policy.
- A DP analytical tool for evaluating who uses (and, presumably who benefits from) DP activities.

Most every chargeback system is installed for one or the other of these reasons. Rarely ever is chargeback implemented for both. "Communications" problems obviously will develop when the system is forced as the solution to problems it wasn't installed for in the first place.

I don't know why we don't bite the bullet and admit that the best chargeback system in the world won't really tell much about computer room performance. This is what we pay our senior DP people to do and they had better be judging things like customer satisfaction, out-of-pocket cost comparisons to similar installations, nature and frequency of operating problems and that whole host of things managers in general have been doing for years.

A.K. McKechnie
Chicago, Ill.

Commuter System Aid Sought

We are desiging a computer-based car pool and transit information system under contract to the Federal Government.

The system will be distributed nationally and will provide commuters with information to help them form car pools and will inform them of the public transportation which best serves their needs.

As an essential part of this project, we are attempting to assess the current state of the art in automated car pool and transit information systems. We are particularly interested in learning about work in these fields which is not widely known. We would very much appreciate hearing from any of your readers who are involved in this type of effort.

William Courington
Bigelow-Crain Associates
415 Washington St.
Marina Del Rey, Calif.

DP a Science, Not an Art

I write in reference to one of the responses to licensing DP that said "Programming is an art." Programming or any other phase of DP should be considered a science, not an art. This does not mean there is not creativity in DP, only that it is controlled.

A painting by an artists does not have to have universal acceptance, as nonacceptance creates little impact. A program must be acceptable by all concerned. The entire DP process is most successful when scientific methods are applied. Anyone who chooses to disagree should consider the "artistic" hands-on program vs. the "scientific" desk-checked program.

Art defies logic and science creates it. Ask why a machine capable of only simple binary decisions can make such gross errors. It is the logical or illogical direction provided by the scientist or artist, not the poor dumb machine, computer operator, keypunch operator, balance clerk or user.

Hugh A. Bursi
Atlanta, Ga.

(Other letters and commentaries on Pages 14, 15 and 16.)

Mackerel by Moonlight

You know, if it weren't for the emotional investment I made in the directorship of the National Bureau of Standards (NBS) computer effort between 1967 and 1970, the current shenanigans about Cobol would be hilarious. There has been a decade-long effort to define a standard, sabotaged at every turn by nutty enthusiasts trying to "improve" the language and by suppliers trying to maintain usually imaginary commercial advantages. But finally a piece of paper emerged. User response has been good, if perhaps a little slow; the American standards organization is notably anorchous.

The Federal Government, which by a factor of four or five is the world's largest computer user, decided to procure ("bring into the federal inventory") only standard Cobol compilers and turned to the Navy for validation techniques. These were to be administered by a committee located at NBS.

I reported some months ago [CW, Dec. 11] my attendance at a meeting where the Computer and Business Equipment Manufacturers Association (Cbema) attempted to get the General Services Administration (GSA) to water down its procurement regulations so that nonstandard compilers could be furnished, subject to vague promises of future fix-up. Much to my pleasure, GSA resisted.

Now I hear that NBS itself, the center of standards philosophy for the entire government establishment, and the specific focus under the Brooks Bill for computer standardization and program interchangeability, has proposed to GSA two "alternate" techniques of Cobol validation – the original technique being complete compliance. One alternative permits the vendor to plead costs and delays, which then become added considerations in the evaluation – a clear invitation to corrupt procurement.

The other proposal allows the user agency to analyze the importance of the various functions of the compiler for its application and verify that only the functions needed "exist and when executed produce expected results." This of course completely obliterates the whole idea of system-independent programming and program exchange.

Even the most innocent onlooker can smell corruption. Why should NBS, which has no direct commitment to the manufacturers and which is charged with helping Uncle Sam as the world's largest *consumer* of software and hardware, turn its back on the Cobol standard and advocate its dismemberment? As John Randolph once said, it "shines and stinks like rotten mackerel by moonlight."

Could be the manufacturers leaning on Commerce, which especially under the Nixons and Fords is notoriously subservient to industry. Could be direct pressure on the director of NBS, or on Ruth Davis; there were six attempts to "assasinate" me that I know of during my three years in charge at Gaithersburg. If so, the poor devils need support from the outside user community. Do you believe the Feds should procure only standard Cobol compilers? If so, write Sid Weinstein, a fairly White Hat, who is Assistant Commissioner for Agency Assistance, Planning and Policy at the General Services Administration. If not, write me!

Herb Grosch

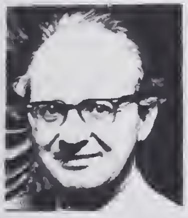
Elimination of Need for Licensing the Real Ideal

One of the advantages of getting mail as a result of a column is some subjects are put in perspective by a choice phrase, thus enabling the discussion to go on after being stuck in a semantic misunderstanding. Such an occasion occurred when Donal B. Tuson of Carling Brewing Co. responded to the April 30 Taylor Report.

The Taylor Report

By

Alan Taylor, CDP



The choice phrase was in the last paragraph, which read: "Contrary to Taylor's opinion, I am far from convinced licensing will do much to eliminate data leaks."

There is a lot in that sentence – so I suggest that you read it again before going on

The first and most obvious point is Tuson narrowed down the discussion to a specific point – the elimination of data leaks. Well, that certainly is one of my basic targets, so I can join him in accepting this as an objective worth fighting for.

As a matter of fact, if you regard the provision of incorrect data or incorrect interpretation of confusing data as being data leaks, that just about covers the waterfront – as far as society interests are concerned.

So, here in a single clause is a defined and apparently commonly held goal which both supporters and opposers of licensing can accept.

The second point is Tuson does appear to agree licensing would do something – although not in his opinion much – to eliminate data leaks. His position here then begs the two questions:

- Are there any actual and potential data leaks which would justify licensing?
- Is there another way which would be more successful in eliminating such leaks?

Now, therefore, we have two avenues of approach to a common target, so the structure of the debate can be seen as well as the component parts.

Elimination Fallacy

Finally, we have the word "elimination." Now, elimination does not mean reduction – or stopping all the important leaks – or anything like that. As Tuson said earlier in his letter, he is not unduly concerned about the Shawmut Bank leak which revealed his company bank account data to me. Yet, his apparent target would only be reached if this and similar harmless leaks were also eliminated. Anything else would apparently not take us toward the goal.

Here, I think is a dangerous fallacy. Take any two approaches such as improved systems design education vs. licensing and evaluate them on their capability of eliminating data leaks or even minimizing the numbers of such leaks and you will come up with a situation which reduces the magnitude of leaks, but lets the really dangerous ones get through. Education certainly has the capability of reducing the magnitude of leaks, but it can take decades before a known leak gets stopped that way.

By contrast, licensing in itself may stop no leaks, but can give society the ability to take actions quickly against the leaks it currently thinks of as important. Licensing, therefore, places on society's shoulders the hardest task of all, determining what is a data leak that should be stopped in society's interests.

Regardless of absolute efficiency, making such decisions is a task which really does not belong to DPers, and methods of handling data leaks without society being built into the system are doomed to failure.

Just to set the record straight, however, I don't yet have any firm opinions about whether licensing of DPers is a good thing. Like Tuson, I suspect it would reduce DP leaks, which I think is a worthwhile goal. But whether it is the best available method is something I have never commented upon, because I don't know.

What I have said is I welcome the debate around the subject which has resulted from the Society of Certified Data Processors (SCDP) actions, particularly because it permits the development of better and better definitions of what the underlying problem is. The debate itself is a form of education and, if carried far enough, might be able to eliminate the need for licensing, which would please everybody.

The Physical Leak

The real problem about data leaks is that, until a leak is used and traced it is normally not recognized to be a leak.

This, in fact, is the serious matter about the Shawmut Bank case. Based on exactly the same information (for George Sullivan, the Shawmut vice-president responsible, had all the information at his fingertips, as I knew when the article was published) the bank saw one leak – and I sat at least two.

The bank leak was a physical matter – the raiding of trash bags left outside during an antibusing demonstration (see box). This is understandable and easily curable. Memos can be sent out to branches warning about what shouldn't be placed in the trash, about how trash should be safeguarded, etc. Nice, easy and well organized to quiet down questioning clients such as Tuson.

What disturbed me much more was that Shawmut system design was in breach of one of the most important data security and accuracy methods, those of "need to know" and "right to check." The report design was bad and encouraged data leaks unnecessarily. That was the point which made me say what I did about the Shawmut systems.

> *'The basic data leak danger comes from system design failures in many cases, and the advertised physical security precautions often serve as a cover-up of the unnecessary risks to which the designer has left the system exposed.'*

The report connected about 10 different areas including:

- Ordinary customer balances and transaction history.
- Other bank transaction history.
- Physical money .movement and storage.

To check that any one of these areas was handled properly, someone had to have access to the full report, even though at least the details out of two of the three were of minimum importance to the person doing the job.

Moreover, areas like the physical money handling have obvious potential society impact. If the technique of finding out where most money is held and how much is moved around at a time become known in the wrong quarters, then expect more bank robberies.

Therefore, this data should be restricted to those who have a need to know this data, not to anyone who has been cleared to see what Carling's other balances are.

With an international bank like Shawmut, even the other bank transaction history can be important. The Portuguese elections are now over, but the political information regarding the individual behavior of various Portuguese banks and whether they were sending money out of the country early this year is again something the Shawmut system design spreads far too widely.

The basic data leak danger comes from system design failures in many cases, and the advertised physical security precautions often serve as a cover-up of the unnecessary risks to which the designer has left the system exposed to.

This is the fact DP people have to start becoming sensitive to if they want to avoid licensing.

I think Tuson's comments have been very helpful and can assist all of us along the road. A few more steps and we may be able to find practical methods for avoiding those design errors and then perhaps we will be able to avoid licensing.

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Carling Data Security Massacred

Two hundred years after a street riot against the British had lead to the Boston Massacre, another group of dissatisfied Bostonians were looking for a way to express their opinions on the busing question.

Their answer was to gather trash bags left out for collection near the ceremonial reenactment of the massacre, including some from Shawmut offices.

Coming down from my offices late that night, which happen to be at the massacre corner, the printouts were there, strewn in the gutter.

Half an hour later they were still there, so, considering them abandoned, I picked up a couple of sections quite at random.

And that's how I got access to Carling's Shawmut data.

Economy, Efficiency at Stake

Elimination of Communications 'Monopolies' Defeating

Reader Commentary

By H.J. Talberth

Special to Computerworld

The article covering Bernard Strassburg's look at the field of telecommunications in the year 2000 [CW, April 9] was of considerable interest – particularly since Strassburg's opinions appear to be inconsistent with his objective judgment responsibilities as former chief of the Federal Communications Commission's (FCC) Common Carrier Bureau.

The history of the evolution of telecommunication responsibilities within the U.S. leading to the current status of regulated monopolies in two areas, domestic and international communications entities, is important to an evaluation and an assessment of what the future trend will be.

The U.S. is unique in that this country runs its communications by private enterprise (under government control), whereas all other countries own and control their internal and international communications.

The reasons are profound and involve not only service to the public, but also the critical needs of government operations, national security and control of international communications under normal and emergency situations. The issue being raised in this country for complete freedom in supplying telecommunications services by any industrial entity should be discussed and reviewed in the content of what the environment would look like if the "monopoly" concept was replaced by fragmented, noninterrelated groups of telecommunications *service* companies and suppliers.

Industry Fragmentation

Some possible aspects of this environment would place a multiplicity of different instruments, directories, calling instructions, service troubles, new service requests, numbering plans, etc., in offices and homes, which would defeat all principles of economy, efficiency, convenience and long-term, cost-effective telecommunications planning.

The identification of a "more enriched source of supply of communications" does not make technical sense. Since there are two basic elements in communications, one being voice and the other being data or digital, this will always be the case unless Strassburg was thinking about ESP as a mode of communications.

The marketplace of communications is composed of individuals, corporations and governments which utilize either or both of these elements. The number of facilities required is directly related to their needs but is obtainable in an intelligent and cost-effective addition or deletion from an "intelligent" total communications plant designed to flex to such demands.

By the use of the term "more enriched supply of communications," it is inferred there would be many systems supplying the same services (voice and data) owned and operated by many companies.

Strassburg's projection of what amounts to a fragmented, unconnected, uncoordinated telecommunications environment for the year 2000 – in place of the existing coherent, coordinated and connected system – is inconsistent with the overview of long-standing policies established to insure supervision of communication operations in the public interest by the FCC.

If any changes are made in telecommunications policy in the U.S., it would appear that, for the same reasons that all other governments of the world have done so, communications should be owned and operated by the national government to preserve the coherence and economics of an integrated telecommunications structure, before permitting it to be fragmentized by uninformed public opinion and profit-orientated, self-interested industrial groups.

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'Total Plant' Necessarily Limited

Widening Market Can 'Flex' for Users

Rebuttal

By Bernard Strassburg

Special to Computerworld

H.J. Talberth's conception of the nation's communications environment is as overly simplistic as his view that monolithic monopoly is the solution to all of the nation's communications needs.

The "total communications plant" of the Bell System and its connecting carriers is not designed for and cannot flex to all modern-day communications requirements. The technical, operational and economic dimensions of that plant are necessarily oriented to the voracious demands and dictates of telephone exchange and long distance services.

These services will continue their tremendous rate of growth. But they will remain as natural monopolies and without threat of fragmentation, in keeping with Talberth's perspective.

However, this "total communications plant," with all of its institutionalized constraints, is necessarily limited and cannot be all things to all users of communications. It does not have the ability to flex to the user demands being generated by the sweeping changes taking place in data technologies and markets.

These are changes which call for diverse and flexible communications geared to the efficient and economical management, movement and manipulation of information. They are changes that call for a type of specialization and attention that cannot be provided by a communications network catering first and foremost to telephone and, secondarily, to all other needs.

It is for these reasons that the Federal Communications Commission (FCC), in recent years, has adopted policies to encourage new entry into the marketplace of new suppliers of specialized communications services and equipment. In doing so, the FCC has harnessed the stimulating and innovative forces of competition upon which this nation has traditionally relied with great success.

The new competition is in its infant stages of market penetration. But it is already resulting in the introduction, merchandising and sale of services and equipment of value to both voice and data users.

The Bell System and other telephone companies, shocked out of their traditional marketplace complacency by the new competition, have reacted with offerings of new services and equipment of their own. They have also restructured their conventional pricing policies in a manner which, in many respects, is being challenged as anticompetitive rather than competitive.

Nevertheless, the overall result is that telecommunications users of all classes have a more "enriched source of supply" than would otherwise be available by an indiscriminate extension of a total monopoly industry structure. Thanks to the spur of competition, supply has become more of a function of demand. Demand need no longer be the prisoner of a monopoly supply.

I suggest that Talberth familiarize himself with the findings of the FCC in its several investigations of supply and demand which led to its competitive policies.

I participated in the formulation of these policies as chief of the FCC's Common Carrier Bureau. My views as to the wisdom of these policies remain unaltered and, in fact, are fortified by today's marketplace of growing abundance.

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Letters to the Editor

Victim of IBM Fear Tactic Still Living in the '60s

G.H. Barger made an analogy to a folk song of the '60s. I think he is living in the '60s.

Barger obviously has been a victim of a fear tactic selling job by an indoctrinated IBM rep, but he still has time to take his head out of the sand to find out what the technology of the '70s has to offer.

I am not campaigning against IBM. Our company, under my direction, has installed and is presently renting an IBM System/3 Model 10; previous to that we were an IBM user dating back to the 407 unit record era.

If people like Barger will just educate themselves as to what is available from vendors other than IBM in the way of the extremely powerful and flexible small computers, he would do himself and his company a favor. Obviously, what is great for one company may not be good for another, but there are enough sincere and dedicated companies in the business of manufacturing and selling systems that there are many options available for the small user.

Needless to say, we canceled our order for a more powerful System/3 and went with one of the successful independents. In the process, we are saving over $1,000/mo in hardware costs and an additional $10,000/year in departmental overhead.

The prime reason we dropped IBM was not only because of the cost savings, but because we are getting a more sophisticated, more powerful and easier-to-operate system for our money, one which will fulfill our current and future needs without costing us an arm and a leg, which is the case anytime you want to upgrade your IBM system. I don't know about Barger, but one of my prime responsibilities is to keep overhead to a minimum.

Philip F. Marquard
Operations Manager
Oatey Co.
Cleveland, Ohio

System/32 Not the First

David E. Ferguson, publisher of *System/3 World*, was certainly correct when he said Basic/Four Corp. would argue his statement about System/32 being the first machine to bring business DP to users with no computer training [CW, April 16] in a story headed, "System/32 Expected to Increase Independent Sales."

Basic/Four was introduced in 1971 and we began deliveries in 1972. The system was designed specifically for small business without prior DP experience. Its architecture, language, operating system and applications programs were designed with the entry-level user in mind.

Richard J. Schineller
Management Assistance, Inc.
New York, N.Y.

'Dilettante' Right Word

Regarding the April 23 article, "Econometric Modeling No Better Than Random Chance," Jack Edmonston stated, "So the science (economics) is really in a very elementary state, and we're probably a long way off from being able to use computers effectively in model building." Nonsense!

An economic model is a mathematical description of an economic situation. Some models represent simple cause and effect relationships. For example, a simple supply and demand relationship is, effectively, a model.

Computers, however, enable us to develop complex relationship models involving hundreds of relationships represented by differential equations. Inputs may be fed to the model more quickly, relationships may be tested for accuracy in a matter of minutes rather than weeks or months and the models may be revised and retested more easily with the great data manipulation capabilities of modern computers.

Models are based primarily on history. If the model works accurately with the immediate past, chances are it will be somewhat accurate for the immediate future. With this in mind, ability to accumulate, enter and manipulate data becomes ever more important.

Edmonston is described as a dilettante economist. The word "dilettante" is defined as dealing with things in a simple way – one of the few things with which anyone with a background of Principles of Economics I would certainly agree.

Daniel L. Sullivan
Marblehead, Mass.

Statistics Prove Nothing

Edmonston's commentary is an excellent five-minute capsulization of the history of economic thought. It is too bad he finished with another prime example of how to lie with statistics. As such, he contributed virtually nothing of substance on the merits, or lack thereof, of econometric modeling.

Robert E. Owens
Milwaukee, Wis.

'Routine' Tests Take Time

How does Alan Taylor have the time to program all of the tests on data that he says can be done "routinely"? Reading his columns, I am awed that he has ever completed writing a program.

I certainly think the computer should be used to check for routine errors such as out-of-sequence conditions, nonnumeric data in a numeric field, invalid codes and so on. But I don't think it is necessary for the programmer to check for the type of error described in the April 23, Taylor Report – in that case, an employee's last name was substituted for the street name on a W-2 form.

In my opinion, a listing should be produced to be checked by a human against the source document at the time of original entry and on updates. It is impossible for the computer to check every error that could possibly occur, unless you have an unlimited amount of time to write and execute a program.

Patricia M. Shannon
Huntsville, Ala.

Astounding New Discovery

Grosch's Law has been known for many decades as a way of expressing economies of scale. Most plants and equipment expand with a cost exponent in the .7 to .8 range.

Computers are somewhat remarkable with a .5 exponent. But how Herb Grosch ever discovered his law using semi-log paper instead of log-log is truly an astounding new discovery.

Donald H. Bein
Milwaukee, Wis.

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Reader Commentary

Facts on Grocery POS Systems Clear Faulty Perceptions

By Thomas Pawlick
Special to Computerworld

Although I have been reluctant to enter the controversy because I work for a grocery chain and have been involved in the study, design and implementation of point-of-sale (POS) systems for three years, I feel I must attempt to clarify the erroneous and unfortunate perceptions some people have about the impact of scanning front-end systems in grocery environments.

To compensate for the misinformation currently circulating about scanning systems, I would like to address the most commonly cited criticisms.

- **The laser scanner is dangerous.** Potential laser damage is no different from that occuring with other light sources, such as the sun, projector lamps, etc. The peculiarity of laser light is in spatial coherence; that is, it can be focused to a very small spot with high energy potential.

Damage can occur when, in the course of the eye's normal converting of light energy to chemical energy ("seeing"), the temperature of the retinal spot rises faster than the tissue can dissipate it. Based on scientific evaluation (and some experience, primarily accidental) lasers for scanning systems have a power factor of 10^{-3} of that required to cause an observable lesion, let alone a noticeable one.

Some may be aware of the experiments done on monkeys with laser beams and the fact that lesions were observed. The laser output in scanning systems is 1/30 that required to achieve a .1% probability of damage to monkeys.

- **Prices are hidden or difficult to know until arrival at checkout.** No chain considering scanning has not recognized the need for shelf labels that spell out to the consumer not only shelf price but also, in many states including New York, unit price of the item.

These labels are certainly a far better means of displaying price than the poorly inked and labeled items currently available to the consumer.

- **Stores can change prices without the customer's knowledge.** In the first place, any movement data we accumulate would be skewed were we to change prices in the middle of the day.

In addition, many chains have remote scanners for customer use to assure agreement between scanner price at the front end and the shelf label. Any minimal benefits gained by the product moved, should the price be changed while in the store, would be more than offset by the negative reactions from alert consumers who would notice that activity.

Not only this, but if the customer were charged a price different from the shelf price, chains in states with unit price disclosure requirements would be in violation of the law and subject to fines.

Finally, if we wanted to cheat the customer we could reprice even now and, except for advertised items, most consumers would be unaware. This question of stores willing to cheat their customers is not only offensive but absurd.

- **Customers cannot compare prices.** The only meaningful way to compare prices is through unit pricing. The vast majority of customers cannot and will not divide the price of one can of peas by its weight and compare its weight and compare it to another.

A price on a product does not give unit pricing, but shelf labels with that data do. We have already determined that these labels are necessary for meaningful price comparison.

- **Customers cannot compare with like items at home.** This is perhaps the most inane argument advanced against use of scanning systems. The register tape gives full descriptive information and price as well as date of purchase.

Currently, to compare this week's price vs. last week's would require pawing through in-house groceries before putting away the new.

In addition, there is no way of telling when a product in the cupboard was purchased. With the descriptive receipt the consumer could compare exactly.

Another criticism is that different stores might have different descriptions. Unfortunately, comparisons between Store A's price this week and Store B's last week often are meaningless because of price fluctuations or weekly specials.

One of the criticisms most difficult to comprehend is that errors will be more rampant with a scanning system. Anyone who has spent any time in a grocery store surely has seen the appalling level of error and loss of time because of unmarked or mismarked items, pricing labels torn so they are unreadable and smudged ink.

Since we will have computers talking to computers and updating prices, we cannot help but have a significant improvement over a part-time stock boy with a messy ink pad.

Finally, we must consider the savings in pricing and repricing. While many of my colleagues agree we can live without the 25% to 30% savings in eliminating them, they overlook a serious problem.

What happens is we price mark all items, but ignore that at the front end and charge by symbol scanning. The symbol price will have a magnitude of accuracy greater than 1,000 to one over manual pricing – but consider the customer reaction when there is a discrepancy.

If we ignore the manual pricing, why put it on?

Pawlick is DP manager of Star Supermarkets, Inc. in Rochester, N.Y.

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B1700-Based System to Link Plants in Four States

Special to Computerworld

HANSON, Mass. – Processing tons of cranberries in a relatively short season requires a sophisticated order entry system to keep the product flowing smoothly to market and consumers' tables all year long.

Ocean Spray Cranberries, Inc. processes in excess of 75% of all the cranberries in the U.S.

The 850-member cooperative has processing plants at its headquarters here and at nearby Onset as well as in Bordentown, N.J., Kenosha, Wis. and Markham, Wash.

Modernize Bookkeeping

To pull these far-flung plants closer together and to give management a better knowledge of day-to-day orders and shipments, a combined order entry and inventory control system was designed for Ocean Spray by ADL Systems, Inc.

Major components of the system are order processing and shipping, invoicing, inventory control and sales analysis functions, according to Ted Eaton, director of management information systems at Ocean Spray.

A Burroughs Corp. B1728, installed here recently as an upgrade from a B500 system, is the central CPU. Burroughs TC 3500 terminals, located in each of the plants, are linked to the Hanson computer via Wats and dial-up telephone lines.

Each day in the order processing system, orders are directed to the plant nearest the ordering customer. These orders, after the necessary hand preparation, are entered on the terminal, edited and stored on a tape cassette.

After the close of business each day, the terminals in each plant are polled by the central computer and the order information is sent over telephone lines at a 1,200 bit/sec rate to Hanson.

The B1728 processes the orders, saves pertinent data relating to sales and inventory and then transmits information back to the individual plants where the cranberry products have been produced and from where they will be shipped.

Cycle Reduced to One Day

In the past, customer product orders were placed by phone or sent by mail to an Ocean Spray plant or to headquarters in Hanson, Eaton explained. Orders were processed and invoices prepared by hand and shipping papers and billing returned by mail.

This time-consuming routine took up to six days. With the computerized order entry system, the order processing cycle has been reduced to about one day.

"We will have more information sooner, so our management can make better decisions on marketing and sales strategies. By capturing the information once, at the time of the order, we eliminate the multiple handling of that information, thus reducing the opportunities for making errors," Eaton said.

Eaton said the most significant reports will be daily order reports, showing number of orders received and processing, a daily report on inventory levels on all products in the plants, weekly status reports on orders and shipments, a weekly report on anticipated inventory levels and monthly reports on sales vs. budget and vs. previous years by food brokers, sales region and customer.

Ocean Spray, according to Eaton, processes an average of 400 orders per day, with about six line items on each order. During the peak season in the late summer and fall, the cooperative processes up to 800 orders per day with eight to 10 line items each.

Gross sales for the cooperative's line of fresh cranberries and cranberry-blend sauce and drink products for the year ended August 21 were more than $109 million.

Interactive Programs

The order processing system developed by ADL includes 38 separate but interactive programs, all written in B1700 Cobol.

"The system functions in a multiprogramming environment on our B1728, while we are communicating in batch mode with the TC3500 terminals," Eaton explained. "The terminals are unattended

(Continued on Page 21)

Unis/90 Aids Factories With Univac Gear

BLUE BELL, Pa. – Basic modules of the Unis/90 data base-oriented production and control system are available now from Univac for manufacturers using Series 90 and 9000 CPUs under OS/4.

Although generalized in overall approach, the system is adaptable to the multitude of control techniques encountered in manufacturing, Univac said.

Unis/90 is built around a data base management system (DBS/90) – said to use only a fraction of the memory required by the previously released DMS/90 – and a Master-Data Processor for bill of material processing and engineering data control.

A production planning and scheduling module will be ready later this month. Other modules, focusing on specific manufacturing problem areas, will be available by the end of the third quarter.

Modification of the system to run under VS/9 and OS/3 operating system environments "is still under discussion," a spokesman added. VS/9 is the virtual system being groomed to replace the ill-starred OS/7 [CW, Jan. 29]: OS/3 is the control system for Series 90/30 processors.

Users working with the Master-Data Processor module are provided with explosion and implosion reporting and all capabilities required for accurate engineering change control, Univac claimed.

Machine Loading

Among the application modules, the production planning and scheduling logic allows several bases for capacity requirement planning, both finite and infinite. Detailed machine loading is also provided under the finite approach, the spokesman said.

Backward and forward scheduling methods are supported, and loading can be accomplished under early start date or latest start date methods. Orders are loaded under priority number control.

An inventory management module includes inventory maintenance and control, time-phased material requirements planning, order monitoring and replenishment control and ABC analysis. Options for three separate costing bases are available, Univac noted.

The work order management subsystem, to be delivered in the fall, allows work order releasing and control. Scheduled orders are selected and availability of materials is confirmed; materials may be reserved but shortages on specific jobs may also be allowed.

Feedback

Feedback from production provides control of work in process and work order status. A priority number control technique maintains the sequence of orders for subsequent scheduling.

A DBS/90 system with three or four record types to be chained and maintained requires about 16K bytes, plus 1.5K bytes per I/O area, exclusive of standard system software; and two disk units, Univac said. Unis/90 requires a minimum 65K.

The basic DBS/90 software is available without charge, while the Master-Data Processor carries a monthly license fee of $75.

Production planning and scheduling costs $175/mo, and inventory management is another $75/mo. Work order management will cost only $25/mo, Univac added.

Consultant Compares T/S Nets

NEW CANAAN, Conn. – Reduction of costs by as much as 40% might be possible through use of a benchmark comparison service of a dozen remote-computing networks now available from an independent research organization, International Resource Development, Inc. (IRD).

The service is built around a set of standardized programs that test each network's capabilities based on seven variables which IRD considers most significant to users looking for the "right" net.

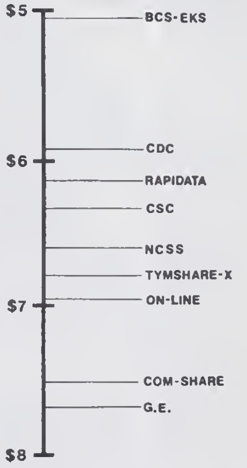
To answer very specialized requests, however, IRD has said it is also willing to run customized benchmarks on one or all the networks to which it has access.

Under either standard or custom testing, IRD can show how a given type of program (an I/O-intensive Cobol run, for example) runs on each of the networks or how a given network handles each of the benchmark situations, a spokesman said.

Packaged Tests

"Packaged" benchmark comparisons analyze such characteristics as price/performance, response time, prime vs. nonprime operations and actual job accounting statistics. User core limitations, documentation and comments of each vendor's version of "public" languages are also included, IRD said.

Both the packaged and custom test results provide the source code of the benchmark program, copies of the console logs to document how the test actually ran and a narrative in which IRD puts the results in perspective.



Benchmark Comparison of Time-Sharing Costs

The custom tests can be run in less than two weeks but costs vary depending on length of program and other user needs. A recent "typical" custom test cost approximately $3,000, the company noted.

The packaged test results are available for $60/copy or $600 for the entire series, IRD said from 46 Main St., 06840.

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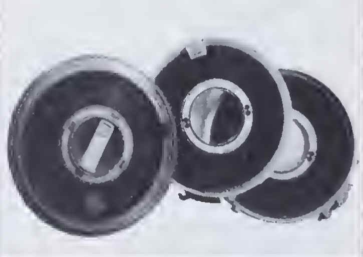

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Infonet's 'Flares' Sheds Light On User Company Status, Plans

EL SEGUNDO, Calif. – General managers with little DP background have still another opportunity to analyze sales and product performance, study investment possibilities, generate financial forecasts and perform complex calculations with the Financial Language and Reporting System (Flares) now available on Computer Sciences Corp.'s (CSC) Infonet network.

Clearly an outgrowth of an earlier Infonet system called Fires, Flares supports reporting and financial modeling done with simple, English statements. Some 20 subprograms are available for specific applications, a CSC spokesman said.

The library of subprograms includes routines to work with discounted cash flows and external and internal rates of return.

Others aid in analyses of mortgages and loans, capital expenditures and depreciations and projections according to exponential or linear trend lines.

The system permits "virtually" unlimited report consolidation and "any" number of simulation variables for "what-if" exercises, according to CSC. In addition, 30 or more math functions are available for complex calculations, a spokesman said.

Flares supports programs written in Basic, Cobol, Fortran or Assembler. Once developed, Flares report formats and models, as well as programs in these other languages, can be stored in the Infonet library for later use.

Designed as a stand-alone management tool, Flares may also be combined with any of Infonet's data base management systems to process and report financial information stored in bulk. The result is a complete information system, CSC claimed.

Flares is available through a local call in 125 U.S. cities and can be used at standard Infonet time-sharing rates.

PPE Monitors Work On Univac 1100 CPUs

SUNNYVALE, Calif. – Univac 1100 series users operating under Exec 8 can monitor the performance of application programs with a special version of the Problem Program Evaluator (PPE) from Boole & Babbage, Inc. (B&B).

As with earlier PPEs, the Univac PPE (UPPE) consists of two basic programs. An extractor monitors and records the progress of the user's application during execution; an analyzer takes the data files created by the extractor and produces the reports necessary for proper analysis of the user's program.

Written in Assembler, the UPPE extractor uses a periodic, timed interrupt to check the status of the program under study and to create the record for the analyzer. External control is provided through control card parameters specifying variables such as memory addresses and file names to be monitored and time intervals to be used.

The analyzer, in Fortran, runs independently of and later than the extractor/application program. The generated reports identify areas in the user program that are used most heavily and therefore hold the greatest potential for improved throughput through improved coding.

Time spend in I/O Wait, programmed Wait and system-imposed Wait are also reported, as is time spent executing executive requests. Taken all together, the analyzer reports should provide the user with enough information to plan possible scheduling decisions to optimize performance, B&B said.

UPPE is currently available from B&B for Univac 1106, 1108 and 1110 users working with Exec 8, Levels 27 and 31. The package has a one-time price of $12,000, including maintenance for the first year of use.

B&B is at 850 Stewart Drive, 94086.

Jovial Compiler Includes Host, Target CPU Choice

BEVERLY HILLS, Calif. – A Jovial language compiler that utilizes the Dynamic Universal Assembly Language (Dual), Jovial J73M is now available from Proprietary Software Systems to run on 14 host computers generating code for 70 target machines.

Total implementation cost for J73M is "under $50,000," the company said from Suite 218, 292 S. La Cienega Blvd., 90211.

NIS Has Decsystem-10 DBMS

LOS ALTOS, Calif. – Data validation, updating with or without transactions, arithmetic operations, sorting, information retrieval and report generation are among the capabilities provided Digital Equipment Corp. Decsystem-10 users by the DPL-10 data base management system (DBMS) from National Information Systems, Inc. (NIS).

Developed in the light of data base work NIS has done for several remote computing networks, DPL-10 uses standard Decsystem-10 files and provides a variety of indexing methods for a choice of data structures. DPL-10 commands may utilize a master file, a transaction file and eight table-lookup files, NIS said.

DPL-10 utilizes self-contained editing routines to check the integrity of data in the system. "Extensive" security controls limit user access by fields as well as by files, NIS said.

Although it has a data base directory facility, DPL-10 has no support for equating one data name with another. Programmers therefore have to be careful to use only those terms that are in the directory.

Written in DEC's Macro-10 language, the NIS system requires 16K of "high core" and another 16K of "low core" on the Decsystem-10.

The DEC-oriented package ranges in price from $27,000 for a basic system, including multifile support, to $40,000 for an extended system providing indexed files and automatic table lookup on as many as eight special files.

NIS is at 885 N. San Antonio Road, 94022.

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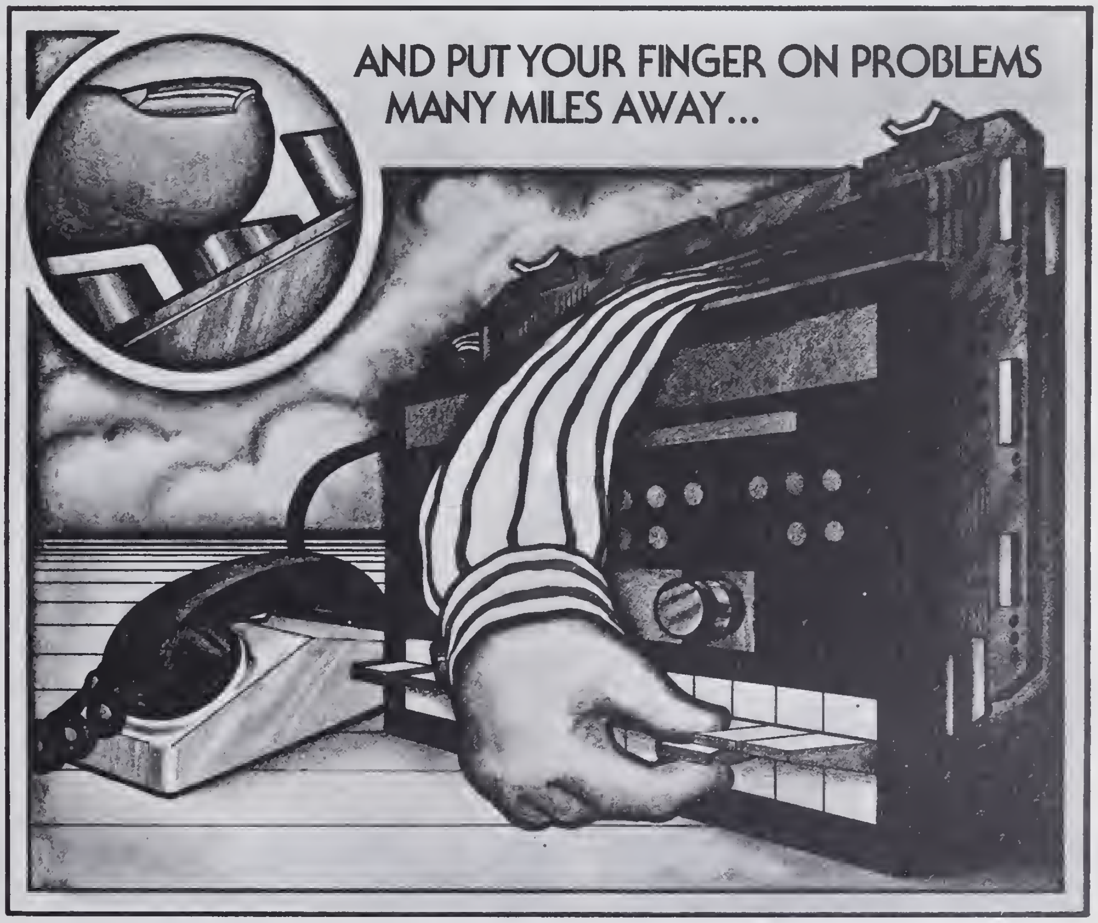
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DCA originally designed the AFP8 to facilitate a remote diagnostic capability now offered for our communications network components and systems, however it is useful for more than just maintenance. For Example:

In one application the AFP8 is used as an installation tool, in which the factory personnel can aid the installation team on the customer's site without leaving their office. Another user makes the AFP8 a standard part of operations of his unattended systems, thereby saving two slots and many cockpit problems.

The AFP8 can also be used to downline load the PDP8 with diagnostics or applications programs, and may also control program loading from a local systems device.

The AFP8 is priced at $1000 in unit quantity, and deliveries have already begun. Generous discounts are available for volume users. If you think that the AFP8 can help you with your product, contact us.

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A Simple But Useful Idea

Program Rework Should Expedite Most Used Routines

By Lou Mills

Special to Computerworld

Concepts and Techniques

One of the simpler but potentially more important tools of the systems analyst is the frequency analysis. It can be as simple as a list of sentences stating how often certain conditions are known or estimated to occur, or it may be a matrix showing expected ranges of anticipated occurrences over a given base time period.

In graphic form, the results of a frequency analysis have a good visual impact, presenting information in a concise, meaningful form. In statement form, the results can be incorporated as comments in a source program, providing at-hand reminders to programmers of the relative occurrence of program events. For system documentation, these analyses can be plotted or graphed.

Frequency analyses are extremely useful when changes to an existing application or system program are contemplated and again after the changes have been completed and some measure of system or program impact is needed. Knowing the frequency of event occurrence expected prior to the change and measuring or projecting the actual frequencies afterward can help reveal problem or "attention" areas.

Easiest Analysis

The easiest type of frequency analysis to construct is one based on a particular program or module of code. By answering questions as to which events occur most often within a program, programmers have an excellent tool for good, efficient program design.

A modular structure may be built for a virtual memory (VM, VS, etc.) system which will group modules of code so that the most frequently required routines and storage areas are main memory-resident the majority of the time.

File open, terminal errors, end-of-job and other one-time operations can be located so that they will be swapped out to a virtual memory area on a direct access device until needed. Contrarily, if an overlay structure is needed for a limited-memory, nonvirtual system, the frequency analysis provides the guidebook for segment design.

Frequency analyses of major system events can also be informative. Consider this common question: "How often do we run (rerun) the A/R system program, and what events have caused us to rerun it?"

Or, from the system programmers, "How many times each week, and for how long overall, do we use the system vendor's generalized sort program?" "Could we write or buy a more customized sort that might be 15% faster?" "Will an anticipated 15% savings in sort time justify the cost and effort?"

Questions of this ilk cannot be resolved if answers on how frequently events occur aren't available.

A good job accounting system can do much of the work of gathering event data during each program run. Unfortunately, however, there are many times the information must be built from other sources, and then the labor cost of accruing the frequency analysis must be considered.

But remember, the final value of a frequency analysis is documentation, and that may be irreplaceable.

Improving Throughput

The most common use of frequency analysis is as an aid in improving the performance or throughput of programs.

Consider the following section of code from an editing card-to-tape program used in a legal office billing system:

```
                   .
                   .
                   .
     IF TYPE-CARD = 1, GOTO IS-ONE.
     IF TYPE-CARD = 2, GOTO IS-TWO.
     IF TYPE CARD = 3, GOTO IS-THREE.
     IF TYPE-CARD = 4, GOTO IS-FOUR.
     IF TYPE-CARD = 5, GOTO IS-FIVE.
     IF TYPE-CARD = 6, GOTO IS SIX.
     IF TYPE-CARD = 9, GOTO IS-NINE.
  IS-ONE.
     ADD 1 to RECORD-1-COUNT.
                   .
                   .
```

Seven different record-identifying codes are checked and branches taken on successful comparisons. At first, the logic looked good, but in fact the program required modification because it occasionally produced a garbage output record and was so internally inefficient the 900 card/min reader would often declutch between cards.

A frequency analysis uncovered the following pattern:

TYPE	NAME	PERCENT
1	Firm Name	.3
2	Firm Address	.3
3	Client Name & Address	2.8
4	Client Legal Matter	3.5
5	Legal Costs	12.7
6	Legal Fees	69.1
9	Payments	11.0
	Total Valid	99.7
	Rejects	.3
		100.0%

Clearly, record types which occurred more frequently were the ones being tested for last, while the least likely records were being checked for first. Not a very efficient piece of coding!

Looking at the code itself (without regard to the frequency analysis – though perhaps inspired by its indication that the sequence of instructions should be changed) the analyst noted that, if the record type was not found during the IF tests, the program logic dropped into the next sequential instruction where the record – probably a reject – was handled as a type 1 record.

Again, an unfortunate piece of coding.

Based on the frequency analysis noted above, the coding was resequenced and enhanced to read as follows:

```
                   .
                   .
                   .
   IF TYPE-CARD = 6, GOTO IS-SIX.
   IF TYPE-CARD = 5, GOTO IS-FIVE.
   IF TYPE-CARD = 9, GOTO IS-NINE.
   IF TYPE-CARD = 4, GOTO IS-FOUR.
   IF TYPE-CARD = 3, GOTO IS-THREE.
   IF TYPE-CARD = 2, GOTO IS-TWO.
   IF TYPE-CARD NOT = 1, GOTO REJECT-
   ROUTINE.
IS-ONE.
   ADD 1 TO RECORD-1-COUNT.
                   .
                   .
```

With other improvements not directly related to frequency analysis, the program was soon driving the card reader at its fully rated speed, while invalid record types were being properly rejected.

Mills is a programmer/analyst at the California Creamery Cooperative in Petaluma, Calif.

Little things that count.

Read all about them in our June 25th supplement, "Minicomputers and Small Systems."

Minicomputers are getting bigger and smaller than ever these days, and they are subject of a special report in the June 25th issue of *Computerworld.* Edited by Vic Farmer, this special supplement will focus on problems and solutions in minicomputer applications and system integration. Drawing on the real-world experience of other users in situations like your own, special emphasis will be given to money-saving ideas. You'll see application stories and tutorials on topics like these:

- **The benefits and drawbacks of time sharing on a large system versus owning a small minicomputer system.**
- **How to recognize and solve problems in interfacing and system integration.**
- **When to call for help - minicomputer consultants and outside software packages.**
- **Satellite system networks - minicomputers as processors in data networks.**

If you're using minicomputers or are considering one, you should be reading this special report in the June 25th issue of *Computerworld.* And if you're a marketer in the minicomputer industry, your ad should be there. Ad closing is June 6th. For complete details, contact your area *Computerworld* representative. Or call Judy Milford or Sara Steets at (617) 965-5800.

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'Laundry' Helps Metacobol User Get, Keep Clean Data Divisions

PRINCETON, N.J. – Three facilities recently added to the Applied Data Research Inc. (ADR) Metacobol programming system extend the capabilities of the package significantly, the vendor said.

Metacobol reduces programming time by generating Cobol source code from macro statements, optimizing programs at the source code level, enforcing local programming standards and handling Cobol-to-Cobol translations.

Other extra-cost capabilities include test data generation, runtime debugging support and performance monitoring.

Distributed free to current users, the newest extensions are a Data Division Laundry (DDL), Accounting Management Review (AMR) and a Metacobol Procedure Documentor (MPD).

DDL is a utility procedure that optimizes Data Division code in the user's Cobol program. It identifies data definitions that can be altered to improve program execution efficiency.

AMR produces a form of job accounting for the use of Metacobol. It lists each use specifically, then shows the name of the programmer, the name of program or module processed by Metacobol and the number of runs involved.

Date of the last run and the number of notes appended to Cobol statements by the Metacobol translater are also reported by AMR. AMR data is useful in monitoring the status of programming projects, controlling costs and checking the degree to which programmers are using the capabilities of Metacobol, an ADR spokesman noted.

While Metacobol as delivered by ADR supports a library of predefined macros for generating and optimizing Cobol source code, it also allows the user to develop other macros to meet special needs. MPD provides the macro writer with mapping and cross-referencing aid in debugging the new procedures.

The basic Metacobol system is available under lease for $610/mo (DOS) or $755/mo (OS) or under permanent license for $11,000 or $13,500.

ADR is at Route 206 Center, 08540.

B1700 System to Link Ocean Spray Plants

(Continued from Page 17)

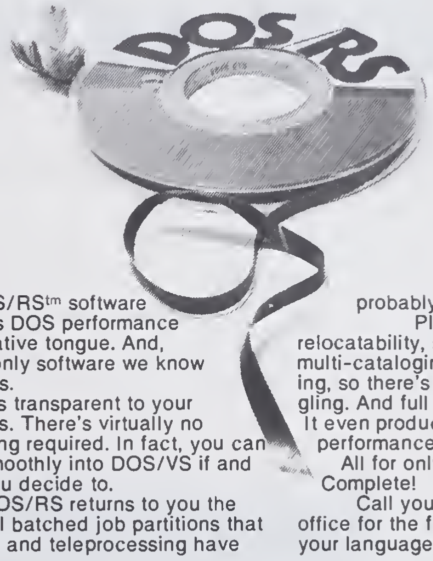
while both the sending and receiving communications take place."

Invoicing of customers, formerly handled by food brokers, now will be handled as a by-product of the order entry information, thus saving time and increasing accuracy of the data, Eaton explained.

"We also will have a more significant volume of in-depth information on sales to customers and for prior periods. This means we can monitor marketing techniques, sales approaches, sales efforts, sales promotions, budgets and salesmen's quotas more closely," Eaton said.

Switch-over schedule for implementation of the system calls for the Kenosha plant – largest and newest of Ocean Spray's plants – to be put on-stream and run parallel with the current system sometime this month. Then the plant in Washington will be added, and the New Jersey plant and the two Massachusetts plants will follow that. The objective is to have all plants on the system by Sept. 1.

Stay native.



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You can go with IBM all the way. Very nice, very convenient, but expensive.

You can opt for one of the other compatible controller-with-terminal systems. It's a cost-effective measure, to be sure, but fraught with complications.

The G77

THE G77 IS A HIGH PERFORMANCE
LOW COST DISPLAY
TO REPLACE OR EXPAND
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COMPUTER CORPORATION
G77 Information Display Terminal

You know them as well as we do. Up-front costs are considerable, too, before the ultimate savings are realized.

Or you can choose the new G77 terminal by GENESIS ONE and leave your IBM control unit alone.

The G77 is a plug-to-plug compatible terminal available all by itself. We call it THE PLUG. Substitute it for IBM terminals or add it on when you expand to extra terminals. No changeover headaches, much lower price, lots of extra features.

Which brings us to the nitty-gritty. How does the G77 compare?

First, here's how THE PLUG compares on compatibility.

The G77 Information Display Terminal is a 100% plug-compatible equivalent of the IBM 3277, Model 2.

It connects directly to IBM 3271 and 3272 Model 2 control units, without any software changes or connecting hardware.

The second comparison is cost.

Like everyone else, we claim savings, but ours are real dollar savings.

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The G77 is available within 90 days. In our business, that's real time savings.

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The G77 does what the IBM terminal will do. And it will do a lot more:

1. A home key to return the cursor to first character position.
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Teletype Develops Binary Synchronous Model 40

By Ronald A. Frank
Of the CW Staff

CHICAGO – Teletype Corp. has developed a binary synchronous version of the Model 40 CRT terminal that can operate at 2,400- and 4,800 bit/sec. In addition, the company has introduced versions of the display terminal that operate at 110-, 150- and 300 bit/sec.

The higher speed binary synchronous capabilities make the Model 40 "compatible with the majority of in-use computer software support systems for display devices," according to internal Teletype Corp. documents.

The latest version of the terminal will allow the Model 40 to operate over multipoint private lines in clustered configurations of up to 24 displays and 12 printers per station controller.

The controller mentioned in the Teletype Corp. documents apparently refers to three control units to be added to the Model 40 to allow clustering and other capabilities.

The CRT clusters will be handled by a Device Cluster Controller that can accommodate four keyboard display versions of the Model 40 and up to two printers. The controller contains a 1,920-character refresh buffer for each display and a 1,920 text character buffer for each printer.

If only one printer is used, all displays attached to the Device Cluster Controller share the same printer. The terminals can be located up to 50 feet from the device controller and printers can be located up to 2,000 feet from the Device Cluster Controller.

Up to six Device Cluster Controllers can be interfaced to a Station Cluster Controller which will handle polling and selection requests from the remote CPU and generate answerbacks.

This station controller will handle formatting of data from the Device Cluster Controllers and perform error-checking functions.

The controller will provide an RS-232 data set interface which is "compatible with Western Electric 201 and 208 data sets or equivalent devices," the Teletype documents said. Apparently this means users will be able to use non-Bell data sets with the CRT cluster configurations.

For users planning a single remote binary synchronous terminal, a Stand-Alone Controller will combine the functions of the Device and Station Cluster Controllers into one unit.

Tentative prices, according to the Teletype Corp. documents, call for a keyboard display terminal to be priced at $190/mo; a Device Cluster Controller would cost $340/mo; a Station Cluster Controller would be priced at $380/mo; and a Stand-Alone Controller would cost $410/mo.

A receive-only terminal with friction-feed printer would cost $170/mo and with tractor-feed printer would be $190/mo.

Teletype has announced additional low-speed features for the Model 40 which include speeds of 110-, 150- and 300 bit/sec. These speeds, if provided for service on dial-up facilities, would signal an end to AT&T's intention not to provide low-speed teletypewriter-compatible equipment.

This stipulation was part of the 1971 sale of the TWX service to Western Union. The restriction was to last for five years and would expire during 1976.

Asked to comment on whether either the low-speed and/or high-speed binary synchronous versions of the Model 40 would be offered by the Bell System, a spokesman said "we are looking at varying speeds and features but no decisions have been made."

For Smaller Supermarkets

IBM Key-Entry 3660 Works Without UPC

By Ronald A. Frank
Of the CW Staff

DALLAS – IBM has introduced a supermarket point-of-sale (POS) system that requires neither Universal Product Code (UPC) labeling nor scanner-based checkout.

Shown at the Supermarket Institute's recent annual convention, the key-entry version of the IBM 3660 terminal system is designed for smaller supermarkets that do not have the minimum sales volume needed to justify a scanner/UPC-based system, IBM said.

Asked if the key-entry terminal system was a reaction to consumer resistance created by the absence of prices on scanner-based checkout systems, an IBM spokesman said this was not the case. The key-entry system had been planned all along as an entry-level system for the smaller market, he said.

Nevertheless, it is possible for a supermarket to install an automated checkout capability with a key-entry model of the 3660 system. Both the scanner and nonscanner versions of the 3660 system use the same 3663 terminal.

The key-entry version, however, utilizes a smaller in-store controller designated the 3661. But a store can upgrade to the larger 3651 controller and still not use UPC scanners, the IBM spokesman said.

There is a savings for a smaller store which selects the 3661 controller at the $12,620 purchase price or $423/mo rental, compared with the higher capacity 3651, which costs $31,060 or $841/mo.

When a retailer operates with a key-entry terminal system, store items can be tracked with a product identification number which IBM called a "velocity code." The key-entry system with the smaller 3661 controller can store prices for as many as 1,275 items.

The code numbers, along with corresponding pricing information, are maintained by the system's in-store control unit. During checkout, the checker keys the code at the POS terminal. The item's price then is automatically retrieved from the controller, displayed at the terminal and printed on a sales receipt.

At the same time, the system can record the sale of each coded item, providing information needed by store management for routine reordering, inventory control, labor scheduling and sales analysis. The controller can provide automatic authorization of payments by check and can compute both food stamp redemptions and taxes due.

Up to 12 terminals can be connected to the key-entry system's 3661 controller. If the controller becomes unavailable, the checker can continue to enter price information and the terminal automatically maintains totals, IBM said.

The system also can provide store information, such as hourly totals by checkstand, as needed by store management. At the end of the day, the controller can help balance terminal transactions and transmit reports to a central computer.

First customer shipments of the 3660 key-entry supermarket system are scheduled in the second quarter of 1976.

Cost will depend on the size of the user's supermarket system. Typically, a store might have six supermarket terminals purchased for $25,964. The system would include a controller and a communications unit for a monthly rental of $467. The entire system may be purchased for $40,388.

With the **IBM 3660** key-entry system, a store can assign a "velocity code".

30 Char./Sec Xerox Terminal Features Chart, Graph Capability

ANAHEIM, Calif. – A 30 char./sec Ascii terminal which also has capabilities for drawing charts and graphs is being introduced by Xerox Corp. this week at the National Computer Conference.

The 3010 microprocessor-driven terminal will automatically create, edit and print documents according to instructions stored in the computer. It may be programmed to print both forward and backward, eliminating the need for carriage return.

The typewriter-paired keyboard provides direct compatibility for APL applications, placing the special characters in industry-standard locations for use with the APL print wheel.

The 3010 operates at 110-, 150- and 300 bit/sec asynchronously, making it compatible with Bell 103A or 113A modems or their equivalents. It will perform in teletypewriter keyboard send/receive (KSR) 33/35 mode, as well as in replacement of terminals being used for text-processing systems and APL implementation, Xerox said.

Off-line diagnostics built into the 3010 can be initiated by the operator to verify correct machine operation or isolate faults in the keyboard, logic or printer, Xerox said.

The terminal uses the Xerox Diablo Hytype printer mechanism, with changeable print wheels and ribbon cartridges and servo-controlled character selection and carriage positioning.

Spacing can be varied by the operator, with a choice of 10- or 12-pitch 6- or 8

(Continued on Page 26)

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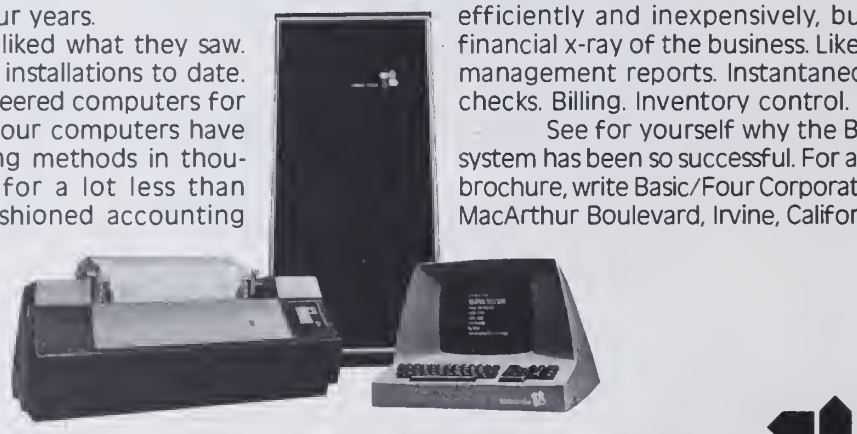

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Harris Adds 1610, Minimum Workstation Remote Batch CRT

DALLAS – Harris Corp. is offering a workstation remote batch terminal as an extension of its 1600 series of remote communications processors.

Designated the Harris 1610, the system features a 16-bit byte-oriented processor with 24K memory module. A teletypewriter console and 2,000 to 9,600 bit/sec synchronous communications interface are standard.

Remote batch terminal emulators presently supported by the 1610 include IBM multileaving, 2780/3780 and Control Data Corp. 200UT. Univac's 1004 protocol will be supported in the third quarter, according to a spokesman.

Peripheral choices include card readers at either 150- or 300 card/min, line printers at 300-, 450- or 600 line/min and a card punch at 100 card/min.

Upgradable to 1620

With field modifications, the 1610 is upgradable to the Harris 1620 system. The 1620 is a multifunction system providing dual emulators operating concurrently to dual hosts and, through future enhancements, will allow the user to perform other applications concurrently, the spokesman said.

Price for a 1610 processor with a 2,000 to 9,600 bit/sec interface, teletypewriter, 150 card/min reader and 300 line/min printer is $1,165/mo including maintenance.

A CRT console may be specified in place of the standard teletypewriter for an additional $20/mo, the vendor added from 11262 Indian Trail, 75234.

Univac Printer Upped To 300 Char./Sec

BLUE BELL, Pa. – An improvement in the speed of the Model 800 terminal printer has been announced by Univac.

The Model 800 now prints up to 300 char./sec. A noiseless, impactless printing technique is said to result in quiet operation.

The printer operates in conjunction with the Uniscope 100 and 200 display terminals and the Univac 610 tape cassette system, providing a full-screen printout of display data in a few seconds. Sustained throughput of the terminal printer is 100 full 80-column line/min, Univac said.

The Model 800 accepts the Ascii code set and creates a printed representation by means of a dot matrix. It includes a full 96 upper- and lower-case character set. Printing may be initiated by the operator or by computer command.

The Model 800 may be purchased for $2,320 or rented for $75/mo, including maintenance.

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Here are two brand new switches with T-BAR reliability that add monitoring or patching and monitoring to T-BAR's field-proven fall back switches.

New Series 5736 in one switch now combines a switchable EIA line with front panel, plug-in monitoring of the activity and quality of every one of 24 lines, plus the added capability of isolating and patching around faults. Available now.

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The "Winchester" Data Module is a completely self-contained unit, incorporating heads, spindle, and recording surfaces in a protective factory-sealed pack. You've heard of the advantages of this new technology . . . complete security from environmental contamination, improved high-density storage, and incredibly fast access. Now you can enjoy this premium performance without paying a premium price.

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For complete details on the BASF "Winchester" Data Module, write: BASF Systems, Crosby Drive, Bedford, MA 01730, or call our nearest regional office . . . in **Los Angeles,** (213) 386-7023; in **Chicago,** (312) 343-6618; and **Clifton, NJ** (201) 473-8424.

You're already paying for BASF quality. . .you might as well have it.

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ATMS Enhancement Option Allows Mixed Network Configurations

CLEVELAND – Addressograph Multigraph Corp. (AM) has announced several enhancements to its Amcat Terminal Management System (ATMS), an integrated hardware/software package whicb is a full service network control system for Amcat terminals.

Amcat is a family of computer access terminals for credit authorization, check cashing verification, on-line data capture and other applications in the electronic funds transfer area. Some of the enhancements are available on the standard system while others are available as options.

Supporting the recently announced dial-up version of Amcat, ATMS now permits all combinations of leased-line and dial-up network configurations of Amcat terminals.

ATMS interfaces to host computers with transmission rates of 2,400- or 4,800 bit/sec using standard IBM Binary Synchronous Communication (BSC) discipline over normal communications lines when the ATMS is located remotely from the host processor.

Additional options to the standard ATMS are those providing up to four 9-track IBM-compatible magnetic tape units (800- or 1,600 bit/in.); up to 4 disk storage units each capable of storing 10M bytes; and a 1,200 bit/sec asynchronous host interface.

In order to broaden AM's data communications capabilities, an ATMS option has been added which provides message switching or routing to a network of host computers.

The magnetic tape capability costs $12,500 for 800 bit/in. and $18,500 for 1,600 bit/in. Disk storage capability for 10M bytes costs $22,500. The high-speed line interface is free for the first unit with additional capability costing $2,500/line. The switch costs $14,500.

All system software is included without extra charge, AM said from 20600 Chagrin Blvd., 44122.

Terminal Transactions

ABC Software Links Burroughs CRTs, Univac CPUs

JOHANNESBURG, South Africa – Automated Business Systems (Pty) Ltd. has developed software that allows users to interface Burroughs terminals to Univac mainframes.

Called the IDC interface, the software allows Burroughs TC, TU, and TD series terminals to be interfaced to both the Univac demand processor software and CMS, "without any modifications," according to the company.

The package is said to make the Burroughs terminal look like a Univac Uniscope 100 terminal as far as the mainframe software is concerned. The communications line has to be configured for the Uniscope 100 with COP printer, although the printer does not have to be used, the company said.

The Burroughs terminal can be connected through a modem or directly to the Univac terminal multiplexer.

The IDC interface requires about 1.5K of main memory and access to the package is through standard instructions using message received, message transmit and error flags, the company said.

The interface uses synchronous line transmission and operates at any speed up to 9,600 bit/sec. The software is available to users for $3,000. Automated Business Systems is at Price Forbes House, 16 Frederick St.

Tycom Expands Savin Word Master

FAIRFIELD, N.J. – The Savin Word Master word-processing system can be expanded by the addition of a Tycom Systems Corp. communications adapter.

The KSR-38 SCA adapter makes the Word Master fully competitive in its ability to communicate directly with any type of computer, data terminal or another Word Master, according to its vendor.

In addition to standard text-editing functions, the Word Master can also be used with the Tycom device to collect and transmit purchase orders, invoices, shipping manifests, and other standard office documents as they are being type for the first time. This data can be stored on cassette tape and transmitted directly to the user's CPU.

The KSR-38 SCA communications adapter converts a word-processing machine into a data communications terminal. It transmits information in Teletype-compatible Ascii format at 10 char./sec in half-duplex mode over phone lines. It can use a built-in acoustic coupler or be directly connected to a CPU.

The Word Master communications adapter is priced at $2,750 for delivery in 30 days from Tycom at 26 Just Road, 07006.

Xerox 3010 Features Chart, Graph Ability

(Continued from Page 23)

line/in. vertically.

The microprocessor allows either the operator or the bost computer to adjust spacing incrementally by 1/60-in. horizontally and 1/48-in. vertically. This adjustment permits the drawing of charts, graphs "and even musical notations" on the terminal, the company said.

Purchase price of the 3010 communications terminal is $5,050. It is also available at $190/mo on a one-year lease. Delivery is scheduled for second quarter of the year from Xerox in Inglewood, Calif.

With More Than 100 Terminal L

Differing CRT Speed

VANCOUVER, Canada – The British Columbia Telephone Co. (BC Tel) has a computerized message-switching network that handles about 2,100 messages per day.

The heart of the internal communications network, Comnet, is a computerized protected message exchange that controls and forwards messages through a variety of terminals operating at different speeds.

With Comnet, no messages are lost – a major step forward for BC Tel's administrative network, which covers more than 100 terminal locations throughout the province.

Experts have rated the network as being able to handle as many as 14,000 messages per hour. This high capability is essential to peak loads as less than 10% of the messages are to just one location; 400 messages into the n
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Introducing Sycor's intelligent '3270' BAT

Our new 500,000 character, dual flexible disk option offers Sycor 250 users the best of two worlds: the storage capabilities of a batch terminal with the inquiry/response features of an on-line terminal.

An on-line/batch terminal.

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For inquiry/response applications, you can store an unlimited number of formats right at the site, instead of being on-line all the time to the CPU. So you leave the line free for more critical traffic.

Or you can store your own program locally. Using our Sycor 250's simple, yet sophisticated FIL language, you can cut line time further by catching operator errors on the spot—instead of at the CPU.

All of which means that you end up using that expensive communications network more efficiently. So you can install more terminals per line, and maybe even install fewer lines.

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Of course, none of this would be possible without the high level of intelligence that we've built into every display. Each display station has its own microprocessor and up to 8K of random access memory for range checking, equal-comparison, arithmetic operations and a variety of other tasks.

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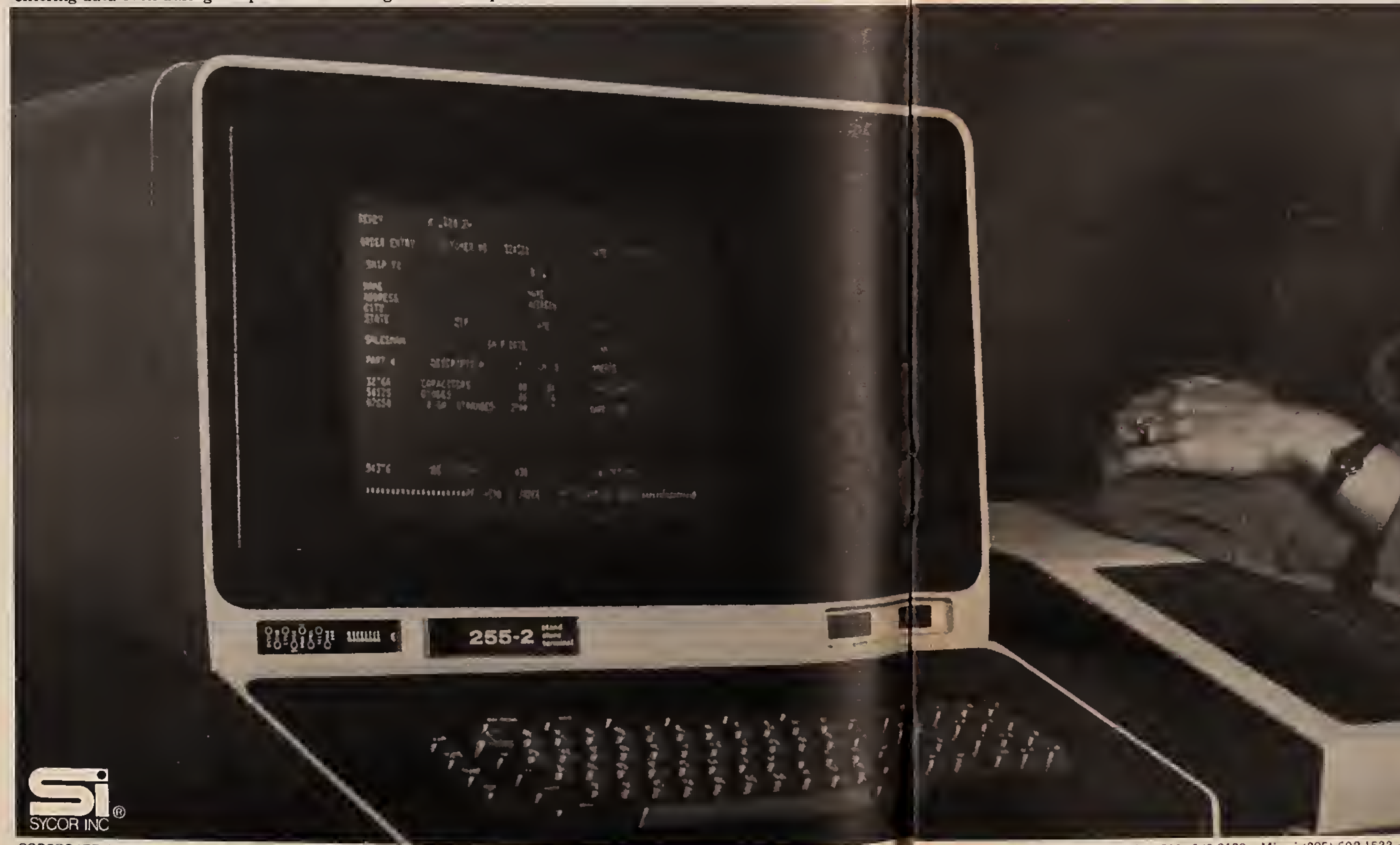

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We've already shipped over 100 IBM 370 compatible memory systems to OEMs and leasing companies. Until now, they've been doing the marketing and service for us.

Now we are offering these systems directly to you. This means you'll get even better service, technical support and very competitive lease/purchase plans.

Intel IN-7158 Memory System for IBM 370/158 Uses the latest in semiconductor memory technology, Intel high speed 4K random access memory devices. Provides memory expansion to 8 megabytes in a single frame. Twice what is available from anyone else and the IN-7158 is available now. Can be expanded in 1/2 megabyte increments up to 4 megabytes, and in 1 megabyte increments from 4 to 8 megabytes. Dial out failing memory (including IBM Memory) in 1/2 megabyte increments. An Intel microprocessor chip, "Intel's computer on a chip," monitors memory system status, controls our "smart" maintenance panel and "score keeps" any problem areas!

Intel IN-7145 Memory System for IBM 370/145 Memory expansion to 2 megabytes in the same frame. Expandable in 128K megabyte increments. A shared port feature eliminates the need to replace IBM memory, even after 256K bytes have been attached. Dial out feature in 256K byte increments allows the operator to replace failing memory including failing portions of IBM memory. This guarantees maximum up time.

Intel IN-7135 Memory System for IBM 370/135 Memory expansion to 1 megabyte in the same frame. That's twice the capacity available from IBM. Because of our unique "swinging door" packaging approach, no additional space beyond IBM's service area is needed. Dial out failing Intel memory in 64K byte increments, including IBM's failing memory.

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Buy, Sell, Lease Plan Can Cut 370/158 TLP by 23%

By Ronald A. Frank
Of the CW Staff

TENAFLY, N.J. – IBM customers with purchase 370/158s and 168s on order can now save up to 23% off IBM's Term Lease Plan (TLP) rates with a lease plan introduced by Computer Finders, Inc.

Called Megasave, the plan covers four- and five-year operating leases and applies to 158s and 168s installed before Sept. 30.

Under the Megasave requirements, the customer assigns his right to purchase the mainframe to Computer Finders. He then has several options under which he can sign a lease arrangement.

If the customer selects a four-year lease, he pays 81% of IBM TLP rates; if he selects a five-year lease, he pays 77% of the TLP rates.

A five-year plan with an early-out option after four years costs 78% of TLP and a four-year termination charge is equal to about two months rental from IBM.

Free to Make Upgrades

During the lease, the user is free to make unlimited upgrades and downgrades "at terms and conditions to be negotiated when changes are ordered."

The lessor retains the Investment Tax Credit and the customer is responsible for any personal property taxes and all insurance coverage. The customer also pays sales taxes and these may be capitalized if desired.

In addition, the customer is responsible for having at least prime shift maintenance on the equipment after the initial warranty period expires.

No More Increases

Users who sign up under the Megasave program will not be subject to any IBM increases for the life of their agreement and will be free to sublease, Computer Finders said.

Only new equipment qualifies under the plan. Because IBM recently announced plans to begin shipping remanufactured CPUs, the customer will have to insist on a new machine in order to qualify under the lease plan. Non-IBM peripherals are not a requirement of the plan.

There are no termination penalties at the end of the plan and the user is obligated only to return the equipment to Computer Finders. All new 158 and 168 CPUs, consoles, power units and channels can be covered under the Megasave plan.

Computer Finders is at 140 Count Road, 07670.

Reconditioned Hardware

WHITE PLAINS, N.Y. – Customers who order 370/158 and 370/168 CPUs without the recently announced Model 3 enhancements will get remanufactured hardware, according to IBM.

The "not in new production" status was assigned to the earlier models of the 158 and 168 when the latest IBM upgrades were introduced [CW, April 2].

Existing orders as of March 24 will be honored for new equipment if they have been scheduled for delivery by March 25, 1976 for the 3158 CPU and by June 25, 1976 for the 3168, IBM said.

Existing orders for both machines that are not now assigned new equipment but whose delivery schedules are approved prior to June 30 "may be filled with new equipment," depending on availability of equipment, sequence of orders and matching of specifications, an IBM spokesman said.

Inforex Increases Editing Capabilities on 3300

BURLINGTON, Mass. – Several systems functions built into Inforex's 3300 are said to provide up to a tenfold increase in the editing capabilities of its recently announced key-to-disk data entry systems.

The 3300 is not based on the firm's previous key-to-disk products, but takes a major portion of its hardware from Inforex's 5000 data base system.

The foreground/background technique on the 3300 permits operators to edit data as it is being keyed or on a nonstop basis for later automatic editing, the company said.

In the conventional foreground mode, the system continuously interrupts operators as errors are detected, enabling them to insert correct information. In this mode, an operator can insert the correct information while the source document is still available.

In the nonstop background mode, operators enter data from a keystation on a continuous basis, without regard to error conditions. The 3300 then automatically performs the editing function after the batch has been completed, automatically flagging all error conditions.

The result of this automatic editing by the system is a rapid increase in the amount of data entered, without any loss of editing power and flexibility, the company said.

Keystroking and error rates are further reduced by the automatic data insertion features of System 3300, the company said. In a typical application such as invoicing, as much as 75% of the actual data needed for computer processing and production of final totaled invoices is stored in or computed by System 3300, the company added.

The System 3300 consists of a CPU that contains built-in editing microprocessors, a 10M-byte disk storage unit, 7-track and 9-track magnetic tape drives and up to 16 operator stations.

Operator support features are designed into the keystations including tab keys, screen scrolling, interactive tutoring, insert/delete character key, return key and numerous other features.

Optional serial and line printers and the capacity to add two tape drives further enhance the system's capabilities. It can also be used in a teleprocessing mode, Inforex said.

Pricing for a basic System 3300 with a control unit 10M-byte disk drive, one 9-channel tape drive and 10 operator keystations is $2,020/mo on a five-year lease. Inforex offers the system on a purchase rental or one-year, three-year and five-year lease basis.

"Parameter rules" are said to allow data entry personnel to define and create applications programs. This technique almost completely eliminates the need for using computer programmers to write applications software, Inforex claimed.

System 3300 tutors the operator through creation of programs right on the visual display screen after the overall systems design is completed. New applications take about two to three hours, according to the company.

Full arithmetic capabilities on the system automatically calculate and insert proper field, record and batch computations for each operator. In addition, the system possesses a "data save" capability, in which accumulated arithmetic totals can be stored for instant operator usage.

A 234-byte-per-batch "save" sector can be subdivided as a user chooses into any number and size of accumulators to facilitate rapid access to either small or large arithmetic fields without lengthy searches or delay times.

Large format libraries on the system permit storage of up to 750 format and reformat sets, each with 15 levels of operator control. This large library eliminates setup time during data entry cycles and automatically provides reformatting of records for computer processing during the transfer cycle, the company said. As a result, labor savings of more than an hour per operator per day can result, Inforex stated.

Automatic data insertion is enhanced by the presence of 255 tables in which users can store regularly used information. As operators enter brief key information, such as a five-digit vendor number, all related information – such as vendor name, address, description, discount rates, etc. – are automatically pulled from one of the tables and inserted in the appropriate fields of the record. This procedure is claimed not only to eliminate up to four-fifths of the keystrokes required during an entry cycle, but assures reliable data conversion, since table contents have been prestored in correct form.

"Tape update in place" eliminates the requirement of shifting data from tape to a disk drive to perform final data entry editing prior to computer processing, as is customary. With the tape-update feature, a user can simply perform his final editing run on tape – fixing correctable errors through System 3300 editing features and flagging uncorrectable ones for computer correction, the company said.

System 3300 is compatible with the firm's Systems 1301, 1302 and 1303.

GTE Extends Key-to-Disk Line With Model Featuring Logic II

STAMFORD, Conn. – GTE Information Systems has added a new model to its 1500 series of key-to-disk systems – the IS/1520.

It features Logic II, a user-programmable language that allows foreground and background application programs to operate concurrently with standard key entry and/or communications activity. Options include: 400 card/min reader, data entry or typewriter keyboards, 200 line/min matrix printer, 165 char./sec matrix printer, a 600 line/min chain printer and a 600 line/min drum printer.

Data capacities now range from 5M bytes to 40M bytes with future expansion to 640M bytes, the company said. To take advantage of the larger storage capacities, optional file access/update instructions have been added to Logic II. A sort/merge utility package will be added by late 1975, the company added.

Purchase price of an IS/1520 with four keystations, 5M-byte storage and 40K core memory starts at $40,680 or $1,536/mo lease, including maintenance. Typical larger systems include 32 keystations, 40M-byte storage, Bisync communications, 600 line/min printer and 64K core memory.

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For details please contact Alan G. Smith, 3728D Silver Star Road, Orlando, Fla. 32808, or (305) 298-0500.

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Honeywell 61/60 Now Less Costly

WALTHAM, Mass. – Honeywell has made modifications to its Series 60 Model 61/60 small transaction-processing computer that reduce by about $1,000 the monthly lease price of a cardless entry-level model.

A minimum 61/60 configuration now can be leased for less than $1,900/mo on a five-year contract, the company said.

Honeywell also announced special facilities at its offices in 13 metropolitan areas in the U.S. to demonstrate to entry-level users how the Model 61/60 and other small computers can aid efficient sales order processing, inventory management, production control and financial management.

The computer enhancements provide lower minimum configuration requirements that extend transaction-processing capabilities to smaller entry-level users. The new configuration makes the Model 61/60 more competitive with IBM's System/3 Model 8 and other small computers in the $1,900 to $4,000 monthly rental range, Honeywell said.

A minimum configuration includes a central processor with 10K bytes of main memory, 10K bytes of microprogrammed memory with dynamic program segmentation, 3.46M bytes of disk storage, 100 line/min printer, 8K-byte front-end communications processor with keyboard control display screen and two magnetic tape cassettes for storage and editing of information. It can be leased for $1,794/mo on a five-year contract or purchased for $82,780. A Minicobol compiler would be an additional $50/mo.

At least one terminal, such as a CRT, Teletypewriter or Terminet, would be required for data entry in this model which eliminates the need for a card console.

Solid-State Power System Acts In Two Roles for IBM 370/168s

MENLO PARK, Calif. – The System 475 solid-state power system from Programmed Power, Inc. is designed to serve the IBM 370/168 user either as a frequency converter or as an uninterruptible power supply (UPS).

Output frequency of the 75 kVA unit may be specified at 400 Hz, 415 Hz or 441 Hz.

When supplied as a UPS, the System 475 not only provides the frequency conversion, but its regulated output voltage provides continuous, uninterrupted power during brownouts and blackouts, the firm said.

Modular design permits a frequency converter to be changed to a UPS at a later time if desired, the firm said.

Standard features of the System 475 are output voltage of 120/208 ±1%; automatic line drop compensation; transient voltage of 5% maximum; and harmonic distortion of 3% maximum.

Efficiency is said to be greater than 85%; and audible noise level is less than 70 decibels.

Input power is 208 VAC line-to-line or 480 VAC line-to-line, 50 or 60 Hz.

The unit also has an automatic redundant fan system.

A System 475 frequency converter costs from $40,000 to $45,000 from the firm at 141 Jefferson Drive, 94025.

Avery Impact Labels Transfer Imprinting To Protected Side

AZUSA, Calif. – The Avery Impact Imprintable Undercover label is said to be constructed so that any method of impact imprinting on the label's surface will be transferred to the underside of the label.

Since the graphics and imprinting are on the underside, they receive full protection of the polyester label material and are impossible to abrade, the firm said.

Once applied, the label cannot be marked again.

Durable as Metal

The result is a label equal in durability and similar in appearance to a metal nameplate, yet with a pressure-sensitive label's ease of application requiring no solvent-activated adhesive or riveting, Avery claimed.

The impact labels cost from $40 for 1,000 labels, but the cost can be two or three times higher depending on customer requirements, a spokesman said from 777 E. Foothill Blvd., 91702.

Monarch Metal Adds Total Forms System

NEW WINDSOR, N.Y. – The multiply burster, slitter and sequence stacker combination from Monarch Metal Products, Inc. was designed as a complete system to separate continuous forms into stacks ready for binding, according to the firm.

The slitter unit will remove one or both margins (line holes and crimps) if desired. The top sheet is then fed through the burster into the stacker in a continuous operation.

The system handles forms up to 18-in. wide with slitting or up to 16-in. wide without slitting and from 2-5/16 in. to 12 in./length.

The burster costs $1,025, the slitter $794 and the sequence stacker $339 from the firm at P.O. Box 4081, 12550.

Keytronic Hand-Held OCR Ups Input Rate 20 Times

SPOKANE, Wash. – A hand-held optical character reader (OCR) from Keytronic Corp. can multiply the input rate of an existing keyboard terminal by up to 20 times, according to the firm.

In a typical application, an operator could read clean documents with the OCR device and input data from poor copies through the terminal.

The OCR can read OCR-A, OCR-B, 7B, 12F, 407, E13B and 1428 fonts as well as hand printing, according to the firm. It can be set to output either Ascii or Ebcdic code.

An OCR reading one font costs $10,000, with additional fonts costing up to $1,000 each from the firm at Building 141, Spokane Industrial Park, 99216.

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We've been waiting a long time to say this:

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Compatibility?

The 980A looks just like a 3270 to the telecommunications access method (BTAM, TCAM, etc.) and to such real time monitors as CICS. It can even operate on the same phone line as 3270's.

However, since your 3270's don't have blinking, lower case, graphics (or most other special 980A features, we might add), applications software developed to support the 3270 won't support our 980A. So we don't think we'll be replacing many of your 3270's.

But, the IBM user can develop new applications around the 980A. And the reason we think he should (here's where you get nervous again) is quite simple. The 980A offers unmatched features at an extremely low cost. Namely, $3200.00 to purchase, $90.00* a month to lease.

And all of our units are serviced by NCR.

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Because even though you're very, very good, IBM, there's always room for a little improvement.

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Hauppauge, N.Y. 11787
ADDS

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Conversion Often Not the Snap Vendors Make It Seem

By Nancy French
Of the CW Staff

SAN FRANCISCO, Calif. – Reconfiguring the data center may be simply a $15,000/mo decision for the vendor involved, but for the user who's signing the contract it's more like a $2 million decision with a four- to five-year commitment in the software, programming and new procedures – and that kind of decision warrants input from top management.

That is the view of David Baker of the Bechtel Corp. who was, until recently, manager of information systems for Hawaiian Electric Co.

"The problem of configuring the data center is too often looked at from the vendor's viewpoint, that is, what kinds of boxes do we need and how do we put them together and, naturally, the bigger the better," he explained at a recent Computer Caravan session here.

"That's understandable since the friendly IBM salesman has always been the one who could say, 'Mr. Company President, I have the solution to your problems.' "

In fact, the "objective in configuring the data center should be minimizing the system, not going big," he emphasized.

COM Came Through

This style of thinking has been exemplified by Hawaiian Electric, which some years ago decided against going on-line and instead chose computer output microfilm (COM) as a cost-saving method for meeting the utility's information needs, Baker said.

Rather than using on-line systems interactively, the company learned, most organizations use them for inquiry only and actually update records in batch mode at night, he said.

"You may think you need 'immediate access' to your data base, but in fact, if yesterday at 4 p.m. is current enough for your company's needs – and it turned out to be for Hawaiian Electric – you can save money by going to COM."

Using batch processing and COM report generation, Hawaiian Electric runs its DP operation at 50% of the national average cost for utilities, he said.

Even Saves Disk

Baker predicted that, in the future, instead of moving to totally on-line systems, users will opt for "hybrid systems" with limited on-line capability that could maintain a code indicating whether activity has occurred in a customer's record during the day.

If the code shows no activity, yesterday's COM record is current, he explained. If activity is indicated, a simple manual file for a single day's customer orders could be used to provide the very latest customer information, he explained.

Such systems would save the cost of terminals, inquiry software, mainframes and also disk space, he said. In addition, "you can buy a COM reader for the monthly rental cost of a terminal," he pointed out.

But Hawaiian Electric is an "enlightened company," Baker pointed out.

More typically, DP departments in most companies have been buried somewhere in the accounting department, regardless of whether they were doing simple accounting or trying to solve the problems associated with retailing or production – "the things that make the company go," he said.

When people started figuring out the real costs of data processing, DP departments started moving upward, becoming more closely aligned with the decision-making level of company management, an evolution that occurred at Hawaiian Electric.

Buy Some Time

In making the decision to upgrade, people often move too fast, without first considering time-buying cost-saving alternatives, Baker claimed.

"Before upgrading, don't overlook your existing capacity. Maybe you're configured to meet the peak of your processing needs and end up with unused capacity at other times," he cautioned.

Second, alternative processing locations outside the company should be considered. "To buy some time, perhaps you could give several routine processing chores to the bank temporarily," he advised.

Third, perhaps on selected card-oriented applications, a company could move to summary cards or put everything on tape to get it into the system faster, he suggested.

Fourth, Baker noted sometimes users do not really use the reports a DP department prints for them every week. Perhaps they really need them once a month, but in between they just get stacked up. Cutting back on the frequency of these reports could buy some additional capacity, he said.

Guidance Vital

However, once a DP department decides it's necessary to upgrade, top management must get involved in order to define information priorities and give guidance on the company's long-range plans, he said.

"Perhaps the company is going to diversify and acquire other companies that are very information intensive," he suggested.

At Hawaiian Electric, for example, when "we upgraded to a Burroughs B3500, we set up an information systems task force, reporting to the president, with only one representative from the DP Department," he said.

Further, he noted, in considering a new configuration, it is important to fully estimate the cost of conversion. Many companies underestimate the cost of conversion by a factor of 5 or 6, he said.

Another point Baker made was ensuring the configuration is flexible enough to move easily into incremental growth.

At Hawaiian Electric, for example, processing grew by 200% with incremental equipment upgrades that cost less than $2,000, he explained, and the company was able to take advantage of key-to-disk data entry with no hassles.

DTC, IBM Develop Element For Model 506 PageReader

MIAMI – The DF-6 typing element jointly developed by Datatype Corp. (DTC) and IBM produces 59 upper case alpha and other characters with a miniature mark code underneath for DTC's Model 506 optical page reader.

When locked in upper case, the element allows part of the IBM Selectric keyboard to serve as a nine-key numeric pad for high-speed numeric entry.

The element is available for $18 from IBM or for $24 from DTC, which is at 1050 N.W. 163rd Drive, 33169.

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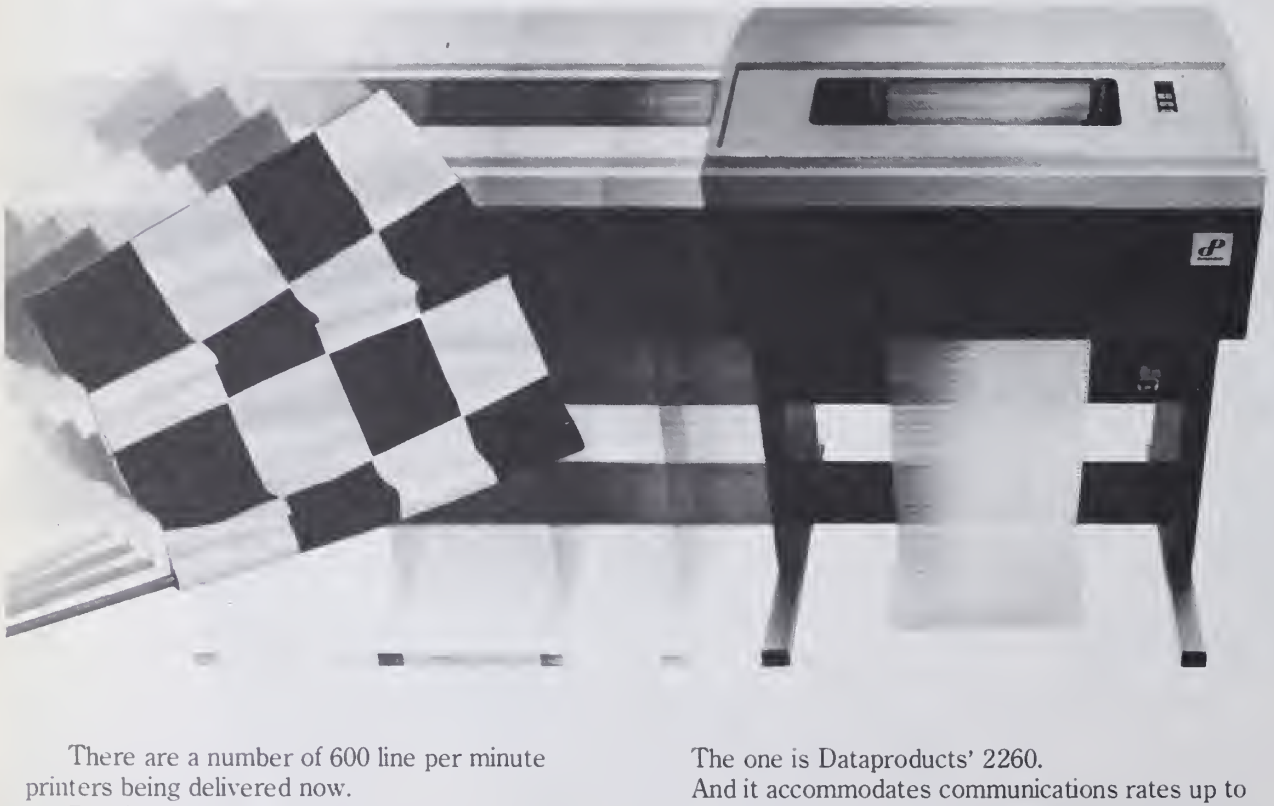

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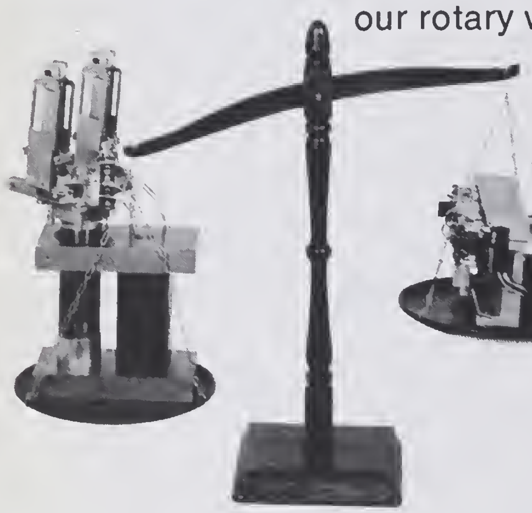
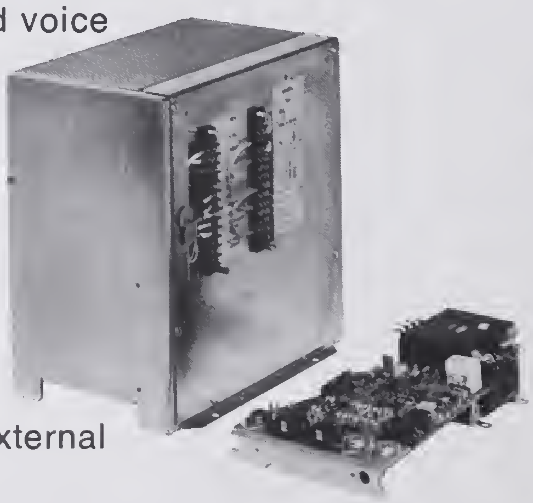


Power? It effects heat, cooling air, user costs, and reliability. Here's a contrast you can't ignore: rotary 40 watts and voice coil 140 watts — steady state. Drive operational comparisons are: rotary drives 150 watts, and voice coil drives up to 600 watts. That explains why some companies need external power supplies.



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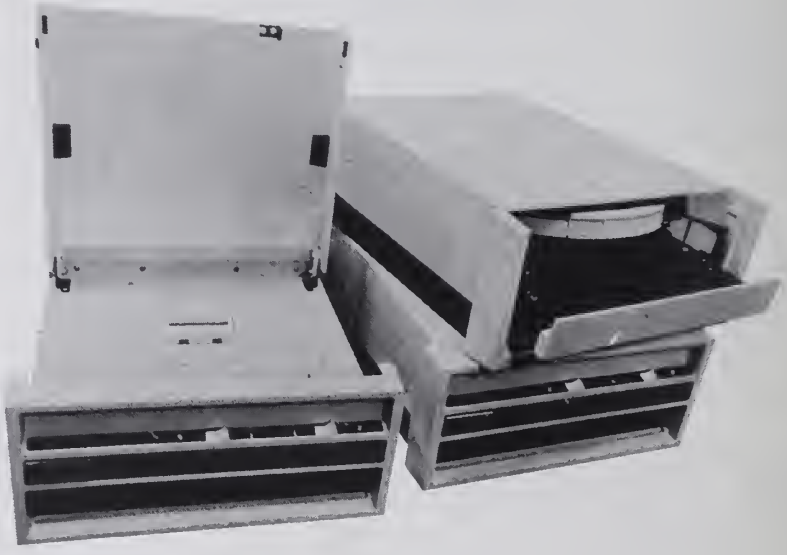

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Mini Bits

Vista Adapter Allows User Remote Peripherals Control

AZUSA, Calif. – The Model 185 remote peripheral adapter from Vista Information Products is said to allow minicomputer users to operate remotely located peripherals.

Interfaces for the IBM 1130 and System/7, the General Automation 18/30 and the Digital Equipment Corp. PDP-8 are available.

Two Model 185s are needed, plus modems. At the mini, one 185 is connected to the same port to which the peripheral (for example, paper tape reader, punch, OCR, CRT, printer) is normally connected. The peripheral is attached to a second Model 185 at the remote location.

The Model 185 costs $2,195 from the firm at P.O. Box 248, 91702.

BCP Introduces Controllers

OAKLAND, Calif. – Ball Computer Products, Inc. has announced a family of controllers for Interdata Model 70, 74 and 7/16 mainframes.

Both the 3260 and 3270 controllers utilize a microprogrammable processor of BCP's own design, contain their own selector channel, use a unique polynomial divisor for error detection and fit in a single I/O slot inside the Interdata processor, the firm said.

Disk drives supported by the 3260 include the Ampex 313 and 323, and the Century Data 114, 214 and 215. The 3270 supports the Diablo Series 40 Models 43 and 44, BCP's own 4300/4400 and Wangco equivalents, BCP said.

The 3270 is priced at $4,800, and the 3260 is priced at $6,500 from the firm at 5601 College Ave., 94618.

Diablo Adds Hytype II Printer

HAYWARD, Calif. – Diablo's Hytype II printer is not a "technological breakthrough" but an evolution of the Hytype I design, according to the firm.

The Hytype II's aluminum frame is said to provide greater rigidity for the printer mechanism and improve print quality. The Hytype II also has a more stable carriage to carry the print wheel and larger diameter rails positioned close to the center of gravity. This improves carriage positioning accuracy, the firm said.

The microprocessor control logic in the Hytype II allows inclusion of additional performance features through better logic capacity and flexibility, the firm said.

The Hytype II will cost $1,800, the same price as the Model I, which Diablo will continue to sell from the firm at 24500 Industrial Blvd., 94545.

Harris Packaged Systems Come in Range of Sizes

FORT LAUDERDALE, Fla. – Harris Corp. has introduced six packaged computer systems, designated the Series 100 and 200. The family of virtual memory systems range in size from 96K bytes to 768K bytes and offers total software compatibility within the series, the company said.

Series 100 includes two entry-level systems: the S110 which is said to offer an attractive price/performance for systems house users and the S120 which is expected to see much usage as a "node" in distributed processing networks.

All systems are supported by performance-enhanced peripherals and the Vulcan operating system that permits concurrent time-sharing, multibatch and real-time processing.

Other major software packages include Fortran IV, Cobol, RPG-II and Extended Basic. Remote job entry to large host processors is also available. The medium-range and large-scale systems include a scientific arithmetic unit that provides floating-point hardware for extra-fast calculations.

System Hardware

The S110 consists of a CPU with 96K bytes of memory, a high-performance tape unit, 10.8M byte cartridge disk, multiplexer and a systems console CRT terminal.

Options include the ability to expand memory from 96K to 192K bytes, a multiterminal capability, asynchronous line interface units, a scientific arithmetic unit and the capability to add a 40/80M byte disk system.

The S120 has 144K bytes of memory and the same hardware complement as the S110 with the addition of a low-speed printer and a high-speed card reader.

The S120 has the same internal options as S110 plus synchronous/asynchronous communications line interfaces, the ability to add on magnetic tape units, the capability to run remote job entry software and an 860 kbyte fixed-head swapping disk.

The medium-scale systems in the new family are the S210 and S220.

The S210 is said to offer a substantial performance increase over the Series 100 systems. It is designed for users wishing to take full advantage of asynchronous computer operation with interleaved memory. The S210 has 192K bytes of memory and the same equipment complement as the S120 with the addition of a 40M byte disk (in place of the 10.8M byte disk) and an 860 kbyte fixed-head swapping disk.

In addition to the internal options available in the S120, it has a memory expansion capability to 384K bytes and can support additional disks, tape drives and terminals.

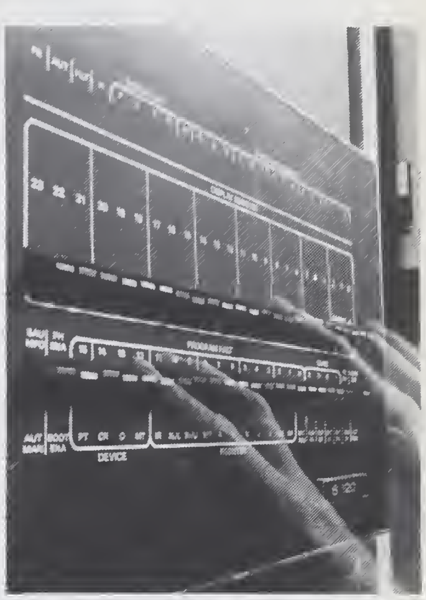
System 220 is a multiprocessing system with sufficient core for highly effective foreground/background operation, Harris said. It is an excellent multiterminal configuration and has a high throughput capability with performance-enhanced peripherals and input/output processor channels.

It has the same equipment complement as the S210 with the addition of a high-speed line printer, a high-speed card reader and a 1.7M byte fixed-head disk. It has the same options as the S210 with the addition of a memory expansion capability to 384K bytes.

Most Powerful

The most powerful systems in the family are the large-scale S230 and S240.

The S230 is a large multiprocessing system heavily oriented to multiterminal time-sharing applications. It can readily function as a host processor for the Series 100 and 200 Systems. It has 480K bytes of interleaved memory. Standard hardware includes a 40M byte disk storage module, a 2.1M byte fixed-head disk, two high-performance tape units, a multiplexer, high-speed printer and a high-speed card reader. It has the same internal options as the S220 including single and multiported semiconductor memory as well as multiport core memory, plus a memory expansion feature to 576K bytes.


Harris Corp. S120 System

System 240 is for the large systems user having substantial core requirements and can function as an excellent host and time-sharing system. Standard hardware includes two 80M byte moving head disks, a 2.1M byte fixed-head disk, two high-performance tape units, two multiplexers, a high-speed printer, a high-speed reader and a systems console video terminal. It includes all the options available on the S230 plus the capability to expand memory to 768K bytes.

The Series 100 and 200 family of computers will range in price from approximately $85,000 to $400,000. Shipments are scheduled to begin in the fall.

Total TEC Workstation Possible With Printer, Drive Addition

TUCSON, Ariz. – TEC, Inc. has introduced a stand-alone single floppy disk drive and a hard-copy printer that enable users to build a complete workstation around a TEC CRT screen, according to the firm.

The Disco-Tec memory system is hardware controlled by its own Intel Corp. 8080 microprocessor. This allows it to work with any RS-232C-compatible terminal in stand-alone mode, obviating the need to go through a separate processor to perform read, write and addressing functions.

The Disco-Tec system includes two I/O ports, each with an independently selectable bit/sec rate. One port handles the connection to operator I/O devices, such as teletypewriters or CRT terminals. The second port allows connection with a computer either directly or through modems.

The Disco-Tec uses IBM-compatible diskette media, full 8-bit Ascii coding capability, switch selection of five possible message lengths, automatic record stepping for cassette emulation, storage capacity of up to 308,600 characters and maximum capability of 3,850 different addresses.

Options include 20 to 60 mA current loop interfaces and daisy chaining of up to nine Disco-Tec units.

The firm's Model 24 printer has effective throughput of 80 char./sec, allowing full printout of an 80 x 24 CRT screen in 24 seconds.

The printer uses a 5 by 7 dot matrix to form characters on 8-1/2-in. by 5-in. electrostatic paper.

The Disco-Tec memory system costs $3,000 and the Model 24 printer costs $1,350 from the firm at 9800 N. Oracle Road, 85704.

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MX/65 Discomputer Combines HP 21MX With 15M-Byte Disk

PALO ALTO, Calif. – The MX/65 Discomputer from Hewlett-Packard (HP) is a combination of the 21MX minicomputer and the firm's Model 7905A 15M-byte moving-head cartridge disk drive.

The minicomputer's 650-nsec semiconductor memory comes in plug-in modules, making it possible to retrofit added memory later, the firm said. The 128 instructions in the mini's base set include floating-point and extended arithmetic.

Nine powered I/O channels are available for peripherals; their use does not reduce the space available to add memory.

Direct memory access through the processor's dual-channel port controller makes programs assignable to any I/O channel; the port controller also provides independent word count and address registers.

HP MX/65 Discomputer

The disk system provides 25 msec average access time and a transfer rate of 936M byte/sec.

The 15M bytes of the moving-head disk subsystem are expandable to 120M bytes with additional disks.

The microprocessor-equipped storage control unit gives the Discomputer automatic error detection and correction to enhance data reliability, HP stated.

A 64K-word MX/65 Discomputer costs $35,600 from the firm at 1501 Page Mill Road, 94304.

FD-103 Floppy Controller Links Interdata Minis, 'Most' Drives

MOUNTAIN VIEW, Calif. – The FDC 103 floppy disk controller from Minicomputer Technology interfaces the Interdata 74, 7/16, 7/32 and 8/32 line of minicomputers to most sectored floppy disk drives.

The controller will support up to four multiplexed disk drives and up to 16 drives per system. Drives supported include the California Computer Products 140, Control Data Corp. 9400, Diablo 12, Innovex 220M, Orbis 74M, Pertec FD 400, and Shugart 901M, the firm said.

The controller is said to support standard or double-density data formats in 8, 16 or 32 sectors per track. This means that over 689K bytes of usable data can be stored on a single drive or 1.3M bytes on a single dual drive.

Reads and writes are fully buffered in random-access memory (RAM) on board the controller. Each controller contains a built-in LED logic probe to assist in servicing.

Basic software (diagnostic, formatter and driver) and complete documentation are included with each controller. DOS is available.

The interface is priced at $950 from the firm at 1901 Middlefield Way, 94043.

Operating System For DEC PDP-11 Introduced by Remex

SANTA ANA, Calif. – Remex has introduced two products: an operating system for Digital Equipment Corp. PDP-11 minicomputers and a combination tape perforator/reader, according to the firm.

The ROS-11 operating system is intended for DEC PDP-11s with at least 8K words that are using Remex's 7400 IBM-compatible floppy disk system, DEC said.

ROS-11 is designed to perform I/O transfers by means of common I/O devices handling routines, to provide convenient access to system and user programs and to handle file maintenance by means of a file utility package, the firm said. A Fortran IV option is also available.

The company's RAR6120 reader/punch includes a 120 char./sec perforator and 300 char./sec reader. The system is bidirectional and will punch and read tape of five to eight levels in paper or mylar.

The ROS-11 operating system costs $1,000 and the RAR 6120 perforator/reader costs $2,550 from the firm at 1733 Alton St., 92705.

Pertec Drives Come In 6M-, 12M Bytes

CHATSWORTH, Calif. – Two moving-head, nonremovable media disk drives for small mini- and microcomputer-based systems from Pertec Corp. offer storage capacities of 6M and 12M bytes. The D1400 and D1600 are available at either 1,500 or 2,400 rev/min. Average seek time for both is 70 msec; track-to-track seek time is 12 msec.

Features of the D1400 and D1600 include media protection, sectoring configurations up to 64 sectors and an optional external power supply.

The drives record data at 200 track/in. with respective bit densities of 2,200 or 4,400 bit/in.

Pertec also offers a disk formatter which can be used to control and transfer data to and from as many as four disk drives.

Price for the D1400 fixed disk drive with power supply in quantities of 100 is $1,925; the D1600 is $2,100.

The firm is at 9600 Irondale Ave., 91311.

Bright 2760 Tape Drive Has Daisy-Chain Capability

SUNNYVALE, Calif. – The Model 2760 125 in./sec tape drive from Bright Industries has a built-in daisy-chain capability, three read threshholds and an overwrite (edit) feature, the firm said.

It can interface with Modular Computer Corp. and Interdata controllers.

The unit operates in NRZI and phase-encoded formats at densities of 1,600, 800, 556 and 200 bit/in.

The drive also has IBM-compatible 10.5-in. reels, quick release hubs and simplified maintenance, the firm stated.

The drive costs $6,050 from the firm at 686 W. Maude Ave., 94086.

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AVC Adds Low-Cost 'Reelette'

SUNNYVALE, Calif. – The "reelette" from American Videonetics Corp. (AVC) is less costly, longer lasting and better attuned to data users' needs than the Philips-type cassette, according to its vendor.

Each reelette contains 80 feet of recording tape with four tracks. AVC's MDR-212 Model 01 drive will read two of these tracks, or 750K bits of unformatted data. The MDR-212 Model 02 reads all four tracks, or 1.5M bits.

Standard operating speeds of the MDR-212 are 10 in./sec read/write and 30 in./sec gap search.

Loading a reelette into an MDR-212 drive is done by placing the reelette on a spindle and closing the hinged cover door. Tape threading and positioning to the beginning of the tape are automatic.

AVC will certify the reelettes for 10,000 end-to-end passes, or twice what cassette makers offer, the firm said.

AVC said it expects the reelette's functional characteristics will resemble those of a cassette and the reelette will probably be used in the same sort of applications.

The firm will provide an RS-232 interface to the MDR-212 drive.

Reelettes cost between $3 and $5, the firm said. The Model 01 drive is priced at $460 and the Model 02 at $535.

Production shipments will begin Oct. 1 from the firm at 795 Kifer Road, 94086.

AVC Reelette

TSP-275 Plotter A Programming Aid

BETHEL, Conn. – The Model TSP-275 plotter from TSP Corp. is intended as an aid to programmers working at IBM's 5275 numerical control station, according to TSP.

The TSP-275 can provide hard-copy plots for checking the programming prior to cutting of the material, TSP said. An option allows the unit to drive a CRT in cases where hard copy is not needed.

The TSP-275 connects directly to the 5275 through an interface and controller.

The TSP-275 costs $3,800, or it can be leased from the firm at Route 6, 06801.

Less Plant Wiring Needed With ICR, ICS Subsystems

MAYNARD, Mass. – The ICR and ICS industrial control subsystems from Digital Equipment Corp. are designed to reduce the amount of expensive plant wiring in sensor-based industrial control applications, the firm said.

The ICR subsystem is designed for DEC PDP-11 systems and provides remote interfacing and multiplexing of digital and analog field signals for monitoring and control of typical industrial instrumentation. The subsystem may be located up to 6,000 feet from the minicomputer.

Engineered and packaged for harsh industrial environments, the ICR subsystem features a microprogrammed controller for implementation of all communication functions, and one million bit/sec transmission of digitized field signals over a single coaxial cable. I/O capabilities include AC and DC sense and interrupt; AC and DC output; I/O counters; analog to digital converters; and digital to analog converters. The subsystem is supported under DEC's line of real-time executives: RSX-11D, RSX-11M and RSX-11S.

The ICR and ICS subsystems cost $4,300 and $2,300.

Calcomp 960 Plotter Interfaces Systems with RS-232 Connection

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has introduced the 960 plotter.

It interfaces on-line with any computer having an EIA RS-232 connection and plots on standard drafting material and preprinted forms, Calcomp said.

Controlled Plotting Speed

Maximum plotting speed is automatically controlled to suit the type of pen used – 30 in./sec with pressurized ball-point pen, 10 in./sec with liquid ink pens. The 960 has a 4g acceleration and reaches full drawing speed within 7.6 mm for ball-point pen and .8 mm for liquid ink.

Calcomp offers software to all users to drive the 960 off-line with the Calcomp 925 controller or on-line with a Nova 1200, HP 2100 or PDP-11. The 960 is priced at $30,000 from the firm at 2411 W. LaPalma Ave., 92801.

Calcomp 960 Plotter

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Digital introduces PDP-11/70. The system all other 11's have been leading up to.

Not just fast, completely fast.

The System is here from Digital. It's PDP-11/70 — and it's fast beyond anything of its size or price ever built.

This complete system is designed for speed inside and out. Not just the CPU, but the software, the cache memory, the I/O channels, the disks, the peripherals — the entire package.

The 11/70, with its 32-bit architecture, is a real-time system, a batch system, and a timesharing system simultaneously. And the incredible low price — from under $100K — means that enormous computer power is about to appear in places it's never been before.

System processor speed. The heart of the PDP-11/70 is a 300 nanosecond central processor connected to system components by high-speed 32-bit data paths (that perform automatic parity checking on both data and address transfers). And by adding a double-precision floating point processor, you can divide two 64-bit numbers in just 9 microseconds.

System memory speed. The integral memory management unit provides memory relocation, protection, and expansion to 2 million bytes of extremely reliable core memory. A standard 2K-byte, 240-nanosecond bipolar cache memory acts like a high-speed buffer between main memory and the processor. The result: an effective memory cycle time under 400 nanoseconds, but at core memory prices.

System peripheral speed. High-speed peripheral controllers plug directly into the central processor using high-speed 32-bit data paths for fast data transfer. Disk transfer time, for example, can be as fast as 4 microseconds for 32 bits. Disk capacity, using the high-speed interface, can be expanded to 700 million bytes of on-line storage.

Complete system software. The PDP-11/70's new multi-function operating system, IAS (Interactive Application System), allows concurrent timesharing, real-time and batch. IAS supports a mix of languages including ANSI-74 COBOL, extended BASIC, Macro assembler, and a powerful ANSI standard FORTRAN IV-PLUS that's designed for the fastest execution time possible.

And for dedicated time-sharing applications the popular RSTS/E system has been enhanced to accommodate 63 simultaneous BASIC-PLUS users with concurrent batch COBOL operation. For real-time applications, field-proven RSX-11D provides multiprogrammed real-time operation with concurrent batch in the background.

The System is here from Digital. PDP-11/70. Completely fast. For full details contact your local Digital sales office or send the coupon below to Digital Equipment Corporation, Maynard, Mass. 01754. (617) 897-5111, Ext. 2540. European headquarters: 81 route de l'Aire, 1211 Geneva 26. Tel: 42 79 50. Digital Equipment of Canada Ltd., P.O. Box 11500, Ottawa, Ontario K2H 8K8. (613) 592-5111.

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Other system(s) now performing on this application__________
Other system(s) in my company or organization__________
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S/7 Helps Control 'Art' of Winemaking

NAPA, Calif. – In an industry first, the Robert Mondavi Winery is using a computer to monitor and control the fermentation of premium quality wines.

"Our mini monitors the fermentation rate and controls it by increasing or decreasing the coolant supplied to the fermentation tanks," Michael Mondavi, son of the winery's founder, said.

"We're making temperature the slave – not the master – of the control function. In the past, winemakers felt fermentation should occur at constant temperatures, Mondavi explained.

"We believe the flexibility we now have to vary temperatures gives the ability of getting the maximum out of the grape."

In addition, the IBM System/7 helps retain and compare vast amounts of information about each wine throughout the fermentation and aging processes.

"In the past," Mondavi noted, "great winemakers could only supervise a limited number of wines before their personal data-handling and memory capacities were overloaded.

"We've begun recording tasting and individual histories on our wines. The historical information correlated with our tasting evaluations are stored in the System/7 for recall when needed to make decisions about a particular wine or wines of future vintages.

"We have only begun to scratch the surface of scientific aspects in winemaking," Mondavi said. "We hope the computer will assist in gathering the specific information to validate our tasting evaluations and thereby further the art of winemaking."

Miniworld at Large

System Simulates Flight Patterns For FAA Air Traffic Safety Project

ATLANTIC CITY, N.J. – Flight safety is a major concern of anyone who steps aboard an aircraft. The Federal Aviation Administration (FAA) is attacking part of the problem with a computer-based system used to test new techniques in air traffic control.

The FAA's system includes four minicomputers, two medium-sized machines, disk and tape peripherals and display units. It was developed by the Washington Division of Logicon, Inc., under the direction of Dr. E.H. Bersoff. The FAA demonstrated the system here recently.

Bersoff said the system is an improvement on the FAA's earlier Digital Simulation Facility (DSF), which simulates quantities of aircraft in an airport flight pattern.

A Xerox Sigma 5 and/or 8 have been generating signals which appear on digital displays resembling those air traffic controllers use. The displays show aircraft in a flight pattern such as the controller would normally see.

Pertinent geographical features such as tall buildings and other potential obstructions also appear on the displays to add to the air of realism.

The DSF facility had included pseudopilots at other displays who reacted to the controllers' voice commands and entered data through keyboards to "fly" the planes appearing in the displays.

But the pilot displays were linked directly to the Sigmas and too much of the Sigma's time went to display processing rather than simulation, limiting the capabilities of the system, Bersoff said.

Logicon's solution was to interface four Computer Automation, Inc. Naked Minis to the two Sigmas as preprocessors, freeing up the Sigmas to provide the sort of capabilities the FAA wanted.

Computer programs are directly loaded into the four Naked Minis in the Pilot Display System from the larger machines, using a software cross assembler/loader and high-speed data channel.

The configuration now includes the six processors, four Model 33 Diablo Disks, 64 Motorola TV monitors for the pseudopilots and controller displays.

Graphics Controller Added by Ann Arbor

ANN ARBOR, Mich. – The S802 Strip Graphics Controller from Ann Arbor Terminals, Inc. is said to provide a video screen alternative to strip chart graphic recorders.

The controller converts 8-bit digital input data into continuously moving strip chart traces on TV monitors, with grid line and alphanumeric labeling/annotation capability optional.

The device is compatible with any computer using a parallel TTL interface, according to the firm.

The S802 costs from $995, depending on options, from the firm at 6107 Jackson Road, 48103.

Lockheed System III

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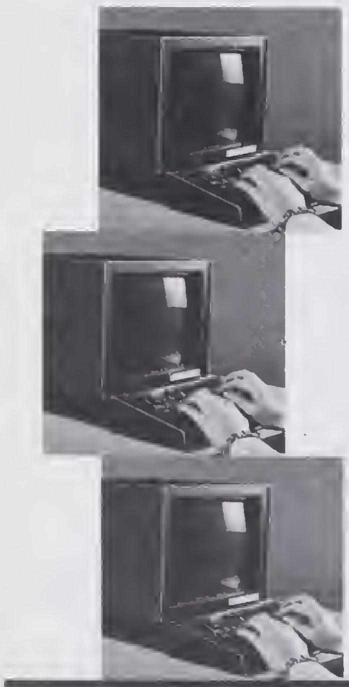

Introducing the Lockheed System III, now with new multi-terminal capability. That's good news whether you plan to use a small computer system or plan to sell them.

System III is designed to grow with you. You can buy what you need now; expand systems when you want. With the new multi-terminal System III models, you can connect up to eight auxiliary terminals, both local and remote. That means nine people can be using the computer simultaneously. With this capability, System III is the most cost effective business computer you can buy.

Interactive capability includes data inquiry/entry and on-line file updating. Each terminal features multi-function foreground operation. And what could be better for inventory control and order entry applications, while your batch processing continues in the background.

Plus you've got a system supported by industry compatible RPG II software, as well as assembly language and FORTRAN. System III also includes File Management, Sort/Merge, operator utilities and editors, all under the control of the Disk Operating System. It can be expanded to 64K bytes, four disk drives providing 20 million bytes on-line, up to 600 LPM printer, and six models of 80 and 96 column card devices.

So if you're interested in a small business computer that can be eight times more useful to you, let's talk. If you want information about using the Lockheed System III, call our nearest office. If you'd like to become a System III dealer, call collect, (213) 722-6810. Or write 6201 East Randolph Street, Los Angeles, CA 90040.

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The V-75 widens the competitive gap even further with the Writable Control Store package. New firmware modules include byte and stack manipulation and accelerated FORTRAN functions.

The new, fast FORTRAN included in the V-75 package is comparable to large machine compilers. With double precision integer data, compiler overlays, seven dimensional arrays, and direct access I/O.

The V-75 leaves the competition behind. Eclipsing Eclipse. The PDP 11/70. And everything else around.

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Koch Hits Privacy Act for Deficiencies in Four Areas

By Nancy French
Of the CW Staff

Focus On Privacy

McLEAN, Va. – While the Privacy Act of 1974 passed during the last Congress represents a "monumental breakthrough in the field of personal privacy safeguards," it is deficient in four key areas, Rep. Edward I. Koch (D-N.Y.) said at a privacy symposium here recently.

Addressing attendees at a two-day program cosponsored by the National Bureau of Standards and Mitre Corp., Koch said the law totally exempts the Central Intelligence Agency (CIA) as well as the entire criminal justice field from any restrictions.

In addition, it only partially covers the Federal Bureau of Investigation, he said.

Further, it permits agencies to withhold from citizens the sources of confidential information and, most importantly, it lacks a permanent Federal Privacy Board to monitor agencies' compliance with the Privacy Act as well as the Freedom of Information Act, Koch said.

The House Judiciary Committee, under the subcommittee chairmanship of Rep. Don Edwards (D-Calif.), is considering comprehensive legislation to cover the entire criminal justice field. However, Koch said he feels "criminal justice systems should be included in the Privacy Act until the Justice Department can come forward with a proposal that the Congress can agree upon."

The second change Koch called for was the "removal of the near-blanket exemption given to the CIA" and a "tightening up of the exemptions pertaining to the FBI.

"These exemptions should be limited only to those files affecting the national defense and foreign policy, those containing information held pertaining to an active criminal investigation and those maintained for statistical purposes and not identifiable to an individual," he said.

Based on Attorney General Edward Levi's testimony before the House Judiciary Committee, Congress knows the FBI maintains 6.5 million files and 55 million index cards that can cross-reference these files, he pointed out.

The total number of files held on current members of Congress is 1,605, none of which can be justified as national defense and foreign policy exemptions, Koch charged.

Access to Accusers

Third, "I feel that provision allowing an agency to withhold from an individual the source of confidential information in his file should be deleted," he said.

"An individual should have the right to see what is in his or her personal file and, if there is something detrimental in that file, to know who his accuser is."

Rep. Edward I. Koch (D-N.Y.)

Finally, "I would like to see the establishment of a permanent Federal Privacy Board to monitor the agencies' compliance with the Privacy Act and the Freedom of Information Act and serve in the capacity of an ombudsman by holding hearings for those individuals who might want to air their grievances in lieu of going to court," he said.

"The current law leaves individuals largely adrift if they need assistance, wish to protest an agency denial of their requests for access or assert other rights regarding their personal records," he said.

Input for Bill

Referring to H.R. 1984, which Koch and Rep. Barry Goldwater Jr. (R-Calif.) have cosponsored in this Congress to extend privacy safeguards to state and local governments and organizations in the private sector, Koch said, "We want to know how this bill should be revised to make it a more workable bill."

"We developed a questionnaire that was sent earlier this year to our 50 state governors, mayors of our 200 largest cities, county executives of our 200 largest counties, directors of our 500 largest industrial corporations and executive directors of our larger unions, trade associations and universities," he noted.

"We have received about 300 comments from these groups to date and will be revising the bill" after all the comments are compiled and reviewed, he said.

Some groups have said it is not appropriate for the Federal Government to legislate what the private sector should and should not do with the information it compiles – that this would be an infringement on their rights by the Federal Government, Koch said.

"I would say to them that we must be concerned that the interests of all the people are served and protected while we attempt to meet the justifiable need of the government and business for information.

"It should be your right and it should be my right to know how material on us is used – particularly if decisions affecting our lives are based on that material," he said.

Citing the difficulties experienced implementing an amendment tagged onto another law last year to open educational institutions' confidential files to students and their parents, Koch said "nothing can create more ill will between the private sector and the Federal Government nor be more hazardous than the hasty enactment of legislation without the necessary comments from the groups which will be affected."

Since cost is a factor with which everyone is concerned, there are some who feel that privacy is a luxury the economy cannot now afford, he said.

"I can assure you, there are many instances where privacy protection can be achieved at little or no cost," he said. "Privacy can be as inexpensive as telling employees to let no unauthorized person see a file," or as expensive as tagging pieces of computered information to ensure security."

Lorain says:

What do a computer and a telephone have in common?

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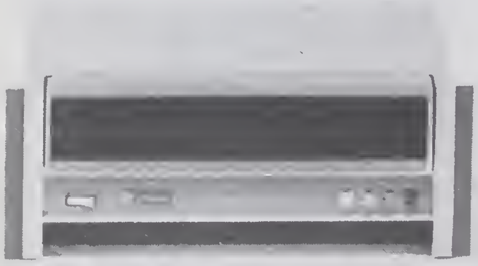

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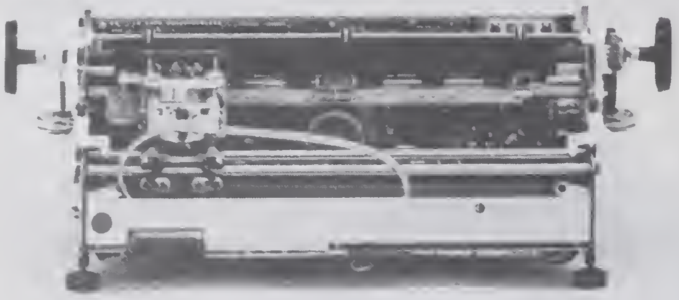

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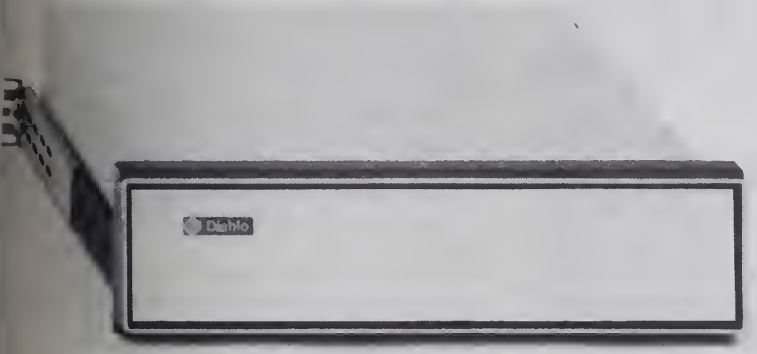

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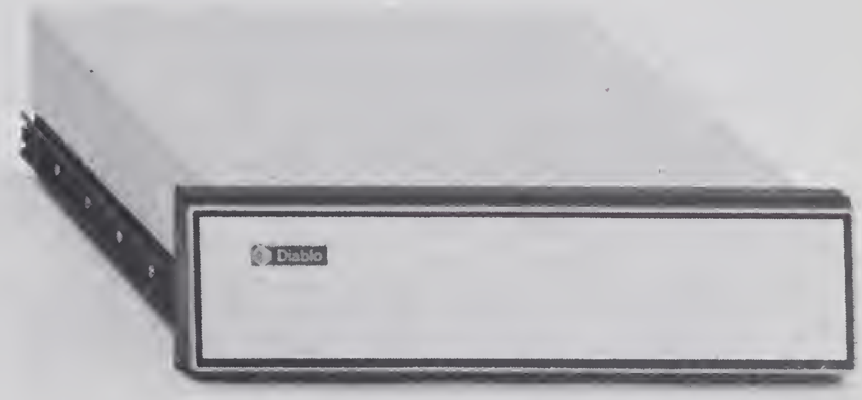

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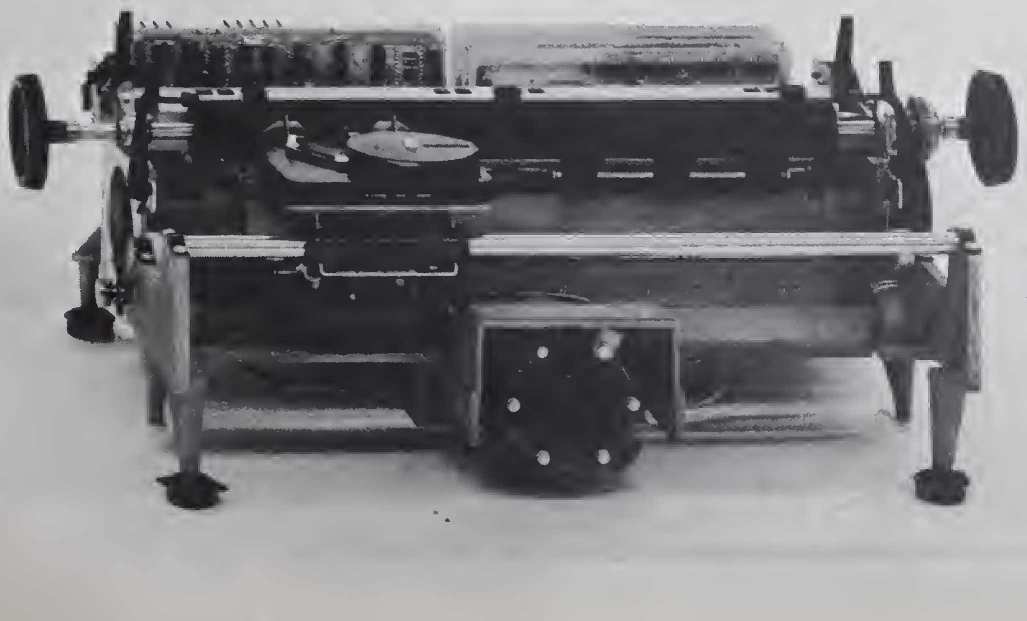

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Extreme Remedies Not Required to Meet Privacy Act

By Nancy French
Of the CW Staff

Focus on Privacy

McLEAN, Va. – The requirements of the Privacy Act of 1974 can be fulfilled without resorting to esoteric remedies such as encryption, multilevel security and ironclad compartmentation, an official from the Office of Telecommunications Policy (OTP) told a recent privacy symposium here.

Charles C. Joyce Jr., OTP's assistant director for government communications, emphasized the Privacy Act does not rule out shared systems architecture. Only sharing and system security need technological solutions to meet the requirements of the new law.

Addressing attendees of the recent National Bureau of Standards-Mitre Corp. privacy symposium, Joyce pointed out the law places no reporting requirement on routine disclosure of information to officers and employees within a given agency who "need to know" personal information to perform their duties.

Administrative procedures are sufficient to comply with such intra-agency disclosure, and these can be implemented with relative ease, he said.

In cases where an agency provides access to a computerized system of records via telecommunications, however, design features will be needed to protect the data, he said.

"At a minimum, procedures must be implemented to restrict on-line access to agency employees who have need for the record in the performance of their duties," he said.

"If a teleprocessing system supports at least one system of personal records and one or more other functions with different user communities, some type of compartmentation will be necessary to limit ordinary access on a need-to-know basis," Joyce said.

Since so much judgment is involved in determining which employees have a "need to know," according to Joyce, the threat of intra-agency dissemination is actually greater under the present law than excessive interagency dissemination.

"A teleprocessing system dedicated to a single agency," therefore, "is not safer in any respect than a properly designed multiagency system," Joyce said.

Interagency Access

In the case of interagency access, according to Joyce, each information transfer must be accounted for, including the date, nature and purpose of each disclosure and the name and address of the person or agency to whom the disclosure was made.

Further, the disclosing agency must assure it was made in accordance with specific, conditions stated in the act.

Presumably, routine uses could be defined well enough to permit automatic disclosure with the necessary accounting. However, others may require human review to determine the validity of the request.

"It may be that future information systems will require 'disclosure review' consoles, at which information requests from other agencies are screened for compliance with agency regulations and criteria," he said.

The solution for the next few years, Joyce suggested, would be "damage-limiting architecture with some type of common user support for small and medium-sized applications and dedicated systems for a small number of the largest and/or most sensitive applications."

The solution was described as a "reasonable and pragmatic compromise between unanticipatible privacy risks and the economic interests of the taxpayers."

Economy, Joyce said, would be achieved by "eliminating some of the smaller, less efficient systems while providing some compartmentation in the event that some unexpected, undesired type of information disclosure should emerge within a shared system."

Cost-Effective Security

With regard to security, Joyce said cost-effective technology exists now to meet requirements of the Privacy Act under normal conditions, whether systems are shared, dedicated, in-house or contractor-operated.

But protection against deliberate attempts to gain access to or modify data in violation of the act is another matter, Joyce said.

The law requires agencies to "establish appropriate administrative, technical and physical safeguards to insure the security and confidentiality of records and to protect against any anticipated threats or hazards to security or integrity which could result in substantial harm, embarrassment, inconvenience or unfairness to any individual on whom information is maintained," Joyce said.

However, "the standard which would be applied in any court" in interpreting the law would be a "prudent man" standard, he said.

Each agency, according to Joyce, would be expected to perform its own risk analysis, taking into account the sensitivity of the data, the various means by which unauthorized disclosure could occur and the feasibility and cost of the various administrative technical and physical safeguards which might be applied.

The cost of safeguards would have to be balanced against the risk of penetration and the amount of harm which could be done, he said.

"Over time, we would expect this approach to produce gradually increasing levels of security" as a result of advances in technology, lower costs of security measures and increases in the sophistication of penetration methods, he said.

Computer Abuses

Evidence shows, Joyce said, that most computer crime and other abuses are typically performed by people with normal access to data or systems software either as terminal users or at the central facility.

"There is little or no overlap between that community of people which uses computers for maintaining systems of records and the community which needs general programming capability in support of analysis or systems development," he pointed out.

"Would it not be feasible, therefore, to segregate these two types of users?" he asked.

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Critics Charge Data Laws Ignore Business Problems

By Nancy French
Of the CW Staff

Focus On Privacy

McLEAN, Va. – Privacy advocates seem to assume personal data collected on individuals is always used to a person's disadvantage when, in fact, that information is used to provide privileges which would be impossible without it, according to Naomi Seligman of McCaffery, Seligman and von Simson, Inc., a New York consulting firm.

That view was seconded by Joseph L. Gibson, senior attorney for Marcor, Inc., Montgomery Ward's parent company. Gibson added that businesses, motivated by both profit and competition, approach data collection from a different standpoint than government and, therefore, should be governed by different privacy laws.

"Collecting, processing and storing personal information is a costly activity," he said. "The profit motive is an effective incentive for restricting data collection only to information businesses consider essential."

Secondly, he said, industry views the personal information it collects as proprietary – a valuable asset – and goes to considerable lengths to ensure the information it has does not become available to its competitors.

Privacy legislation "would not put any large companies out of business," Gibson pointed out, but it would "raise the cost of credit and even goods and services."

General Problems

Seligman described seven general problems associated with most privacy legislation, namely: notification of data subjects who are part of a file, steps recommended for resolving data disputes, registration of data banks, transfers of data, records of access to systems, "reasonable" security and the risk of harassment resulting from frivolous and irrelevant inquiries.

The cost of notifying an individual who is the subject of a given data system is not unreasonable as long as data systems are defined only as formal systems.

"However, if informal systems such as those maintained by individual supervisors and managers in their desk drawers are defined as data systems, such notification could result in one of two problems," she said.

First, such systems would be discontinued, "reducing the effectiveness of management, or new central systems would be created consolidating the information," thereby increasing the number of people with access to the data, she said.

Notifying new data subjects they are to be included in a data base is not a sizable cost item for business generally, but notifying data subjects already on an existing file would be a more serious matter. The problem becomes "unmanageable" if the law requires organizations to notify "inactive data subjects or secondary data subjects" such as insurance beneficiaries, she pointed out.

"The law should permit an organization reasonable time to respond to a request for access to a record, and this must be within the limits of the technology already employed by the organization and existing clerical staff," she said.

Procedural Snags

Despite the "merits" of the basic concept, Seligman noted several procedural problems.

Most legislation defines grounds for dispute in very "fuzzy," nonquantitative phrases which will be surely difficult to determine, she said, and all bills provide that organizations shall maintain some record of an unresolved dispute.

"It would be impossible to include a statement of dispute in a computer record, but a code is certainly feasible," she said.

In the area of registration of existing systems, Seligman pointed out that filings should occur no more often than there is new use of the system outside the "routine" practices of the organization or where external uses already exist, a qualitative change involving the personal information content of the records.

"Refilings for every enlargement, modification or change in the system are obviously burdensome and pointless," she said.

Acknowledging the Health, Education and Welfare Committee's concern about misuse and transfer of data from one agency to another that could produce a dossier covering all aspects of an individual's life, Seligman attacked the language of the law as "abstract" and lacking in any reference to the cost of the disclosure to the individual whom the data concerns.

"We recommend that business transfers be permitted in certain cases without the consent of the data subject if that use is the legitimate responsibility of the organization maintaining the data."

Secondly, transfers between organizations should be permitted if the recipient is acting solely as an administrative service for the originator. Third, the required level and techniques of data security must be related to the practical and economic state of the technology and to the sensitivity of the data involved.

'Reasonable Security'

As for "reasonable security, we believe the degree of security should be appropriate to the sensitivity of the data and no regulation should require activities which are beyond the economics or feasibility of currently available hardware," she said.

It is assumed the Office of Management and Budget will emphasize administrative safeguards to provide "reasonable" security, but it is also expected the new law will encourage computer manufacturers to develop more effective hardware and software security devices, she said.

Even For Trivia

"With all due respect, this raises the possibility legislation will force the application of these devices, regardless of how costly or inefficient for all 'personal data' no matter how trivial or unimportant it is to the individual," she said.

"From a cost point of view, an emphasis on physical and administrative security" would be preferable, she said, and, if there is continuing insistence on electronic security, the statute should permit an organization to separate sensitive personal data onto an inherently more secure medium such as manual files, off-line storage or courier transfer, she suggested.

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Mass. Gives Burroughs CJIS Equipment Contract...

BOSTON – The Criminal History Systems Board here approved a seven-year, $58,293/mo contract with Burroughs Corp. recently for equipment to operate the state's criminal justice information system (CJIS).

Focus On Privacy

The vote, which okayed the lease-purchase of two B6750 systems, ended a 31-month dispute over the privacy and security implications of a consolidated system accessible to all the state's criminal justice agencies.

At the request of Gov. Michael S. Dukakis, the approval was contingent upon a written agreement assuring cooperation from the state's judicial officials – a step that raised questions of separation of powers in many state officials' minds.

The joint system will require the Commissioner of Public Safety (Police), the Commissioner of Probation (courts) and the Commissioner of Correction (prisons) to place their manual files in the hands of the Criminal History Systems Board for conversion.

Two Problems

Board members saw the problem as twofold: First, could the commissioners be convinced it would be in their best interest to give up control of their criminal offender records and, secondly, would better security and privacy safeguards be provided by a single system or three separate computerized systems.

The board voted 10 to 2 in favor of the joint system.

Unlike most automation disputes, the controversy has not been over whether to computerize, but over how the job should be done.

Privacy advocates, including former Gov. Francis Sargent, Attorney General Francis X. Bellotti, Harvard Professor Arthur Miller, outgoing Criminal Justice Committee Chairman Arnold Rosenfeld and American Civil Liberties Union privacy specialist Natasha Lisman, supported the single-system approach on grounds it would provide better privacy safeguards, cost less, require fewer personnel and less communications equipment.

Public Safety Commissioner John Kehoe argued against the proposed CJIS contract on three grounds: First, that police do not need to be on-line to criminal histories; second, that the number of terminals involved in CJIS would endanger security and privacy of the system; third, the costs of the CJIS conversion effort had been "outrageous"; and, finally, the files the state had chosen to computerize lacked the positive identification criteria established by the National Crime Information Center's Computerized Criminal History System. Only the "rap" sheets contained offender fingerprints.

Opposition to Contract

The Probation Commissioner also opposed the CJIS contract, citing his fear that the Supreme Judicial Court, a separate branch of state government, would have to cooperate to make the system work. "Interference" with the judiciary could occur under such a system, he argued, and "maximum efficiency was not necessarily compatible with our democratic system of checks and balances," he pointed out.

CJIS will be based on a twin-mainframe B-6750, with terminals at remote locations for data input and inquiries.

The system will provide a means to identify users at terminals, limiting access to valid users and secure files against unauthorized access and/or operations.

A system will be maintained to log all invalid attempts to access the system.

The controversy over this project began to heat up in 1972 when a state law was passed to limit for the first time how police could use criminal files.

At the time, privacy violations were well documented. Two state troopers were accused and then indicted for selling rap sheets to private investigators. And raw arrest record information, often without dispositions, was overflowing shoe box files in the probation central file room with sensitive information virtually free for the asking, even by phone.

The condition of the files has not changed since that time. However, the conditions under which the information may be provided to nonlaw enforcement agencies has been limited considerably as a result of recently approved state regulations [CW, Jan. 29].

At present, Massachusetts has three central repositories for criminal offender records: the central file at the Department of Probation, the incarceration and probation records at the Department of Correction, and the Mass. Bureau of Identification files at the Department of Public Safety. The Department of Public Safety also operates a computerized system known as Leaps, which catalogs all wanted persons and stolen property within the state and interfaces directly with the NCIC.

Leaps System

The Leaps system, which will become a subsystem within CJIS, services approximately 200 ASR-28 Teletype terminals in local police departments. Leaps interfaces with the National Law Enforcement Teletype System (NLETS), Drivers Registration Enforcement System (Drives) and the Boston Police Department computer system in addition to NCIC.

Officials say Leaps has no capacity for expansion, provides no file security and only minimal control of file access.

In addition, there are no limitations as to system use at any terminals, which account for at least 80% of Leaps users.

Each of these filing systems is independently maintained with no formal cross reference, but information is exchanged on an informal basis.

To support his case for a computerized system, Arnold Rosenfeld studied the three systems and found them sorely lacking. Probation Central contained about five million records, some of which dated back to 1914.

The file serviced 650,000 inquiries in 1973, a typical year, Rosenfeld said. Probation Central handles between 2,500 and 3,000 transactions per day, but has been falling behind in filing new transactions at the rate of 500 per day.

More than 15 transactions per day are posted to the wrong name, and a test of 2,000 records showed 61 duplicate files. Fewer than one-half the records are fully updated, he said.

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...As Costly Record-Conversion Project Continues

Focus On Privacy

BOSTON – As part of the overall Criminal Justice Information System (CJIS), a Criminal History Record Conversion (CHRC) project was begun here in late 1971 to translate active criminal offender records into machine-processable format.

Most states that made the decision to computerize criminal records have done so simply by converting the Federal Bureau of Investigation's (FBI) criminal histories or "rap" sheets.

Since Rap sheets often lack correct disposition data and also contain offenses based on laws formulated in different states, Massachusetts officials said they decided against that approach and, instead, chose to merge data collected by three departments within Massachusetts – the Department of Public Safety (DPS) (police), Department of Corrections (prisons) and the Department of Probation – to develop what they considered to be a more complete and accurate system of records.

That decision touched off an intense dispute between state officials and the FBI's National Crime Information Center's (NCIC) Computerized Criminal History (CCH) system.

This dispute, along with the NCIC/CCH's "failure to establish minimum national standards for the collection, maintenance and dissemination of criminal records," according to state officials, form the basis for this state's refusal to participate in CCH.

Some feared the decision would result in the loss of federal funding, but that never happened and, despite FBI opposition, the state's conversion effort proceeded with funds from the Law Enforcement Assistance Administration.

It was soon realized conversion would be no simple task.

Project leaders decided it would be both unnecessary and impossible to convert the state's 5 million records and chose instead to give higher priority to the most active and serious offenders, adding records of less serious offenders as they committed new crimes and new arrests were logged.

"When the project was started, a sampling of records showed an average record length was 5.6 offenses, with the court segment averaging 31 entries. Today, records we are converting average 2 offenses, with court segments averaging 13.6," he explained.

Priorities were carefully defined, with first attention given to records of persons engaged in the judicial process and to records of persons who had been arraigned for at least a felony or a serious motor vehicle offense such as operating under the influence of drugs or liquor, operating so as to endanger lives and safety and leaving the scene of an accident.

Fingerprints on file at the DPS and at least one conviction were next on the priority list.

The second highest priority was given to individuals whose records showed them currently on probation and who also had fingerprint cards on file at DPS.

Fingerprints and other information such as mother's and father's names and birth date had to be matched with criminal history data held by the Commissioner of Probation to assure the individuals were one and the same. Each arrest, court appearance, continuance and disposition had to be included.

Because rules and regulations governing criminal history systems were not issued until after conversion started, arrest records without dispositions were converted as is. They will be purged as soon as the system becomes operational, in accordance with the state's recently issued regulations, according to a CHRC official.

Skyrocketing Costs

Record conversion and its accompanying administrative chores turned out to be so time-consuming that costs skyrocketed to around $80 to $100 per record.

Basic to conversion was the problem of developing consistent abbreviations for all crimes, dispositions and sentences, for example.

A Digital Equipment Corp. PDP-11/20-based system had to be developed and established at the probation central file room with terminals located at the DPS's Massachusetts' Bureau of Investigation and the Department of Corrections, and workflows for record conversion and maintenance had to be designed, documented and thoroughly tested.

Audit and quality control programs had to be designed and executed to insure security and accuracy.

All these activities affected cost figures.

Clerks were trained to enter all the records converted, according to CHRC personnel. Depending on the length of records involved, between 60 and 100 records per day are being converted at the present time, and to date, CHRC has converted 22,000 individual criminal history records to computerized form, they said.

In addition, 30,000 cases for offenders were traced through the district court process to produce judicial statistics, and a uniform crime code was established to show correspondence between Massachusetts law and federal crime definitions.

Battle Goes On

The battle is still going on between state officials and the Justice Department, as evidenced by a Feb. 25 letter from the state's newly elected Attorney General Francis X. Bellotti to U.S. Attorney General Edward H. Levi, calling attention to the failures in the FBI's NCIC/CCH system.

"Massachusetts general law prohibits either primary or secondary access to criminal records by noncriminal justice agencies except as provided by specific statutory authority. However, once we allow our records to pass outside our borders we can neither enforce this standard nor guarantee adherence to it," Bellotti said.

"Further . . . Massachusetts will not alter its position until suitable standards are implemented," Bellotti told Levi.

Several bills pending in Congress this year tend to support Massachusetts' stated position on computerized criminal histories and the privacy and security safeguards such data should have.

How Congress will vote when the time comes is difficult to assess, but if any one of those bills is approved, principals adopted in Massachusetts will be the rule.

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Critic Says Important Distinctions Overlooked

HEW Report Too Broad, Spells Trouble for Business

By Nancy French
Of the CW Staff

Focus On Privacy

McLEAN, Va. – The 1973 Department of Health, Education and Welfare (HEW) report "Privacy and the Computer," errs by failing to distinguish between types of reports, lumping intelligence reports with consumer credit and investigative reports, Joseph L. Gibson told attendees at a recent privacy symposium held here by the National Bureau of Standards and Mitre Corp.

Gibson is senior attorney for Marcor, Inc., parent company for Montgomery Ward.

A consumer credit report is "an objective report which includes such basic information as name, address, occupation, number of dependents and record of payment on credit accounts.

"Whether a data subject paid or did not is a relatively objective fact," Gibson said, without addressing the problem of disputed bills or outdated records.

"The investigative report, he said, contains more subjective information about the data subject's life-style, habits and relations with other people."

This is "legitimate information," according to Gibson.

Enormous Problem

"The size of this problem is enormous," Gibson said. "A corporation like Montgomery Ward maintains an average of 50 different data systems.

The HEW Report, which focused on broad, basic principles, declared that no data system should be secret and recommended that the existence of all systems be published by industry in newspapers, not merely by type, but by name of the data subjects involved.

"That conclusion works to the undoing of privacy for data subjects who would object to the world's knowing they have a relationship with Montgomery Ward," he pointed out.

Industry does not have the alternative of publishing in the *Federal Register* and, instead, must publish in newspapers where advertising rates are staggering, he said.

Most individuals are aware of their data files. Credit customers, for example, receive monthly reminders that credit grantors have a file on their account, he said.

The concern with "secret" files, typified by credit bureaus, has already been addressed by the Fair Credit Reporting Act which requires a person be notified of the existence of a credit report that was used in denying him credit, he said.

Industry recommends the data subject be informed of the existence of files through normal course of business.

As for recommending that businesses establish a system to enable them to respond to a consumer's inquiry as to whether the company has a file on him, "this assumes the state of computer practice is much more sophisticated than it actually is," he said.

To respond to such an inquiry, a business would have to maintain a totally integrated filing system or make a costly search of every file system," he said.

H.R. 1984 Labeled Restrictive, Costly

WASHINGTON, D.C. – Present privacy legislation covering the private sector introduced in the U.S. House of Representatives could restrict the transfer of information and cost business substantial amount of money, William A. Fenwick said at a Data Processing Management Association briefing here recently.

Fenwick, who is head of the American Bar Association's Committee on Law Relating to Computers, said the omnibus approach of the bill – H.R. 1984 – causes the problems.

Instead of singling out areas of possible abuses and setting regulations for them, the bill, which is sponsored by Reps. Edward I. Koch (D-N.Y.) and Barry Goldwater Jr. (R-Calif.), treats every recordkeeping system exactly the same, he said.

Fenwick, who noted he was in favor of regulating the Federal Government's use of personal information, indicated business should be regulated only in areas where there are abuses.

Business would not just have to review a few files in order to comply with the law as written, Fenwick said, but would have to review all its computerized and manual files to determine which ones have any personal information in them.

Then each business would have to determine how that information is used, where it is disseminated and the use of that information, he said.

The act, he said, will, therefore, restrict the flow of all information

At the same time, Fenwick noted there was no exemption in the bill to permit the exchange of personal, public information such as newspaper reports, crime records and the like. This could raise serious first amendment problems, Fenwick said, potentially making it a "20th Century book-burning act."

The bill needs more balance, he said, noting that at present it would be in conflict with the recently passed Freedom of Information Act which opens up access to government files.

Furthermore, Fenwick charged, "a trilogy of confusion" has lead to the acceptance of a need for such legislation on the part of many in society.

First, he said, many believe just because something is technically possible, it is actually being done. But, he said, even though it is possible to merge diverse files on individuals, it is not being done today, at least not on a very widespread basis.

Secondly, the privacy requirements should regulate just personal data banks, but, instead, affect almost all files.

Finally, he said, it is a gross simplification to believe one bill can cover all the different uses of personal information.

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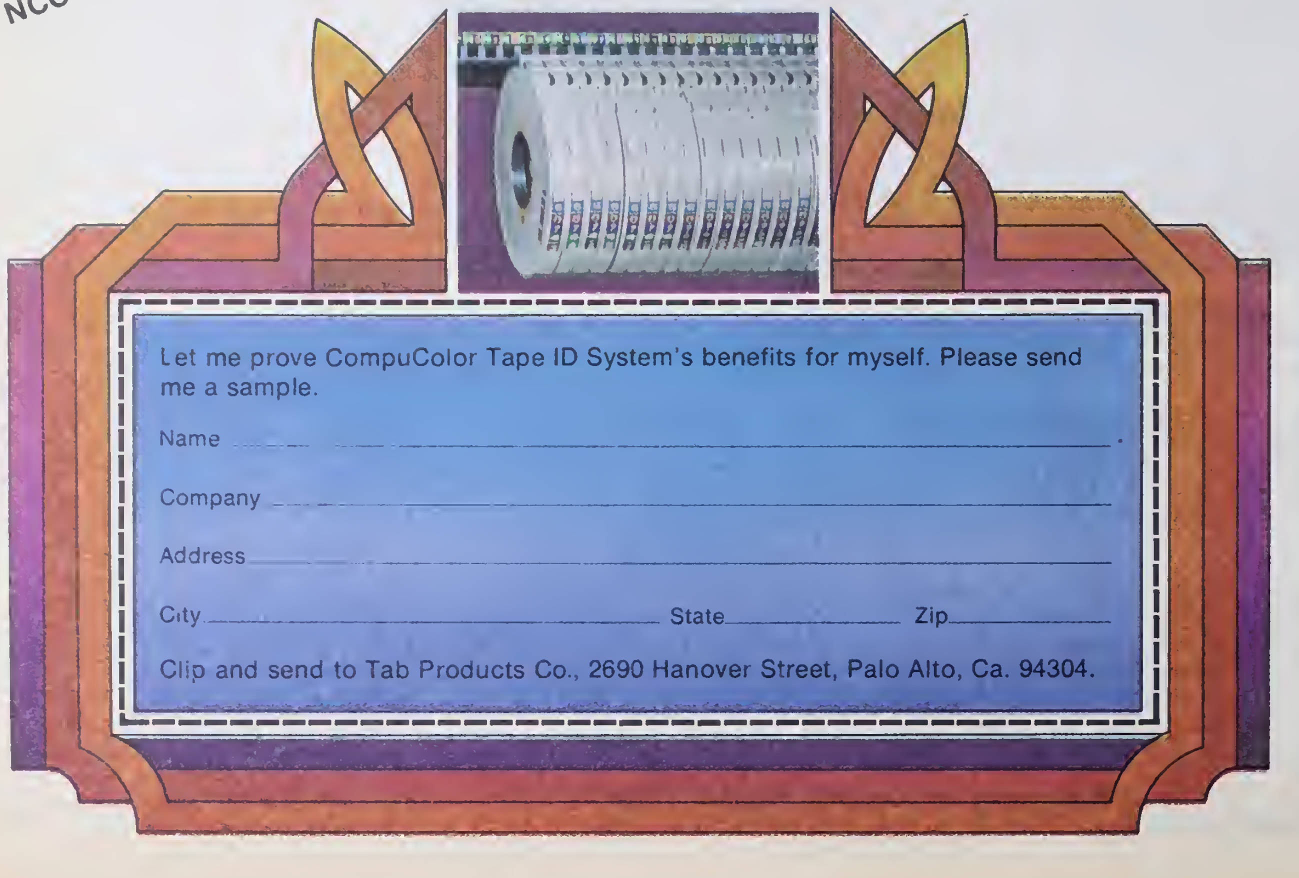

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System Cuts Medicaid Processing to 11 Cents a Claim

Evaluation of its ongoing Medicaid system resulted in a completely new system for Medicaid claims processing in Albany County, New York. The system is said to process a provider claim at a computer cost of 11 cents.

Albany's system handles physician, dentist, pharmacy, hospital, nursing home and most other provider claims through the same set of programs. The county contends this single stream of data flow for all providers is the major factor in its low cost.

Processing 50,000 Medicaid claims a month, the county uses an IBM 370/135 with 3340 disk drives. Eligibility data is entered directly using 3270 terminals, while claim data entry is accomplished by a 3740 key-to-disk unit.

By Charles Butkus
Special to Computerworld

In Albany County, we receive, batch and keypunch claims daily. These were edited for keypunch errors and processed for claim validity (client and provider eligibility and fee pricing), and exceptions were listed out for review and possible correction.

At the end of each week, the accumulated claims processed and corrected during the previous five days were considered "frozen." No further corrections could be performed on them, and totals were sent to the accounting department for payment.

Claims were paid monthly when there was money. When funds were insufficient, only the providers whose services represented a cash outlay (like pharmacists) were paid.

Since bill processing is totally dependent upon client eligibility, it was implemented first. A client was given a Medicaid card to verify to the provider his elegibility for Medicaid. Bills submitted by the provider were then checked against the client's eligibility record.

Processes Kept Separate

The three essential processes of input edit, claim validation and claim payment were kept separate. Each process, however, was designed to accommodate all provider claims. No separate system for any type of provider was permitted.

The edit process edited all batches entered. The validate process confirmed all claims regarding client eligibility, provider eligibility, fee validity, pricing and duplicate checking. The payment process listed all claims for each provider and placed payment information on each claim transaction.

The eligibility routine used in Medicaid card production was also used in client eligibility checking for claim validation. All providers went through the same validation routine. All fees were priced and checked with the same routine.

This commitment to the complete integrity of each process forced the simplicity and versatility in its construction.

Versatility in processing was provided by use of a transaction code. New claims would be completely validated. Claims already processed would not be reprocessed unless corrected. This mode of processing lessened the dependency on time and allowed any number of changes to a claim.

Bills needed a batching method with a simple, defined audit trail.

The provider number, linked with the date each set of claims was received, became the batch number for each bill set. This permitted unique identification of each batch and a clear audit trail without an additional data element.

Bill processing was begun with some delusions of grandeur. Management felt that every claim (then 70,000- to 80,000/mo) should be manually reviewed after computer validation. Errors detected by the computer were reprinted every day to continually remind the clerk of any corrections that should have been made. The clerks found the paper stacks both intimidating and too voluminous to review effectively.

So the system was modified to print only the new daily claims found in error. We fumbled our way into exception processing.

Though the majority of the claims processed without difficulty, error codes carried into the payment run weren't properly handled when multiple errors were found.

When claims were deemed invalid due to a program bug, we simply corrected the bug, changed the transaction code on all incorrectly rejected claims to make them appear "corrected" to the system, then reprocessed them.

Once the initial crisis was over and bills were effectively processed, the system was progressively "deintegrated" by tacking on desirable features.

We added a drug-pricing subsystem, a nursing home subsystem and provider check production. A hospital payment subsystem was appended, as was pricing for anesthesiologists, provider mileage, visiting nurses, hearing aids and eyeglass frames. All state-required reports were tossed into the system. We also began to experiment with utilization review.

These "improvements" made the system cumbersome to maintain and difficult to run.

So we performed a critical evaluation of the system.

We found a lot of things wrong. Though claim processing was rapid, the slow cash flow caused problems. The provider didn't receive the invalid claims until he was paid for the valid ones. This was frequently too late to contact the client, obtain the correct data and resubmit the claim.

In some cases, while the processed claim lists were waiting for payment, sections of the list were lost or misplaced. Consequently, portions of the payments had to be rerun.

The numerous interim files presented operator problems in running the system and inquiry problems as to claim status. Timing problems were incurred in updating the Medicaid history file; some claims paid but not yet on the history file were removed too soon from an interim file and appeared to be missing.

Inquiries for vendors and clients proved difficult in this multiinterim file environment; a program was needed to access each intermediate file in addition to the Medicaid history file.

The lack of controls after the initial batch check in the preedit program gave us real headaches. When an operation error occurred, we had to manually match the hard copy with the contents of each interim file to determine what was lost. Though we seem to have lost no bills, we sure lost time trying to find and reprocess them.

These problems couldn't be solved by revamping the old system. So we began to design a new system to eliminate them.

(Continued on Page 53)

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

A/V Vendors' Next Aim Should Be Communications

J. Daniel Couger On **Education**

This time last year, I decried the shortage of self-study, audio/visual (A/V) courses on data base design and data base management systems. That gap in the widely expanding array of A/V courses narrowed significantly in the ensuing year. Data base courses are now available from five companies.

The gap this year is in data communications courses. Edutronics and Advanced Systems, Inc. (ASI) have multimedia introductory level courses. IBM has an introductory text/audio course and an IMS/VS teleprocessing video course.

But instructors need intermediate and advanced level courses. Hopefully, in the next 12 months this deficiency will be corrected as was the data base deficiency in 1974.

The range of available teaching materials has grown so much that every course is affected. By judicious selection of A/V modules, all courses can be enhanced. I'll illustrate that point below, in addition to describing the trends in development of A/V materials for DP instruction.

In earlier years, the A/V producers emphasized sale of complete courses. Their reasoning was easy to understand: they needed to recover development costs. Earnings are now at the level to permit these companies to rent materials – individual modules as well as complete courses.

This situation provides great flexibility for the instructor. For example, in my system design course I use modules from Deltak to teach basic system analysis and design concepts, and modules from Edutronics to introduce data communications concepts. In my management information systems (MIS) course I use Deltak's introduction to data base design and the Honeywell/Cincom introduction to the data base management system Total.

From 25% to 50% of the content in each of my DP courses is now covered through self-study using multimedia materials from a variety of suppliers. This situation allows me to spend more time preparing lectures on advanced state-of-the-art subjects. It also allows me time to work with students on individual projects designed to reinforce the concepts and techniques covered in the courses.

Also, through delegation of the more routine subject areas to my coinstructors on the media, I have more time to update myself. The dynamic computer field requires constant retooling for instructors; I believe I reearn my doctorate every three years through the requirements of keeping abreast of changes in the field. I'm thankful that instructional aids are available to give me time for continual retooling.

The industrial trainer has similar demands on his time. The variety of courses impacts the government/industry training environment even more than that of the university.

Trends in Development

In addition to the above-mentioned materials made available this year, Control Data Corp. and IBM produced IMS courses, ASI will release its IMS course this summer, as will Edutronics and Deltak.

Conversations with the media producers reveal the following courses to be released this summer: Rohit Pitel (ASI) – structured programming, VS dumps, programming logic and techniques; Joe Piergrossi (Deltak) – structured design; Pat Sorrentino (Edutronics) – structured programming; Roy Zabierek (CDC) – teleprocessing and advanced programming.

Tony Pellegrini (Honeywell) said a course in IDS will be released by year-end. IBM continues its policy of refusal to release advanced information on its courses.

In addition, the *Eighth Annual Guide to A/V Instruction in Data Processing* was released this month by the University of Colorado. The guide lists the products of each of the suppliers of A/V materials. For a copy send $4 ($5 if you require an invoice) to A/V Guide, University of Colorado, Cragmor Road, Colorado Springs, Colo. 80907.

Couger is professor of computer and management science at the University of Colorado.

Processing Cost Cut On Medicaid Claims

(Continued from Page 51)

The rebuilt system eliminated most interim files, added controls, placed all pricing in the validate program and combined all pricing data into a single file.

Now the claims are preedited for keypunch errors, then reformatted and sorted into provider type and provider number sequence.

The validate program then determines client and provider eligibility and prices all fee schedules. Duplicate claim detection is accomplished by a separate program.

When all corrections have been made, the good claims are accumulated on a separate file in anticipation of payment processing. And a claim-error list for the providers is generated during this process so the provider doesn't have to wait until payment time to correct and resubmit his mistakes.

At payment time, the claims to be paid are stripped from the payfull file and placed on a separate file for subsequent reporting and Medicaid history file updating. The system accomplishes these functions at the nominal cost of 11 cents a claim.

The recreated system was much simpler and more versatile than the old. Fewer programs and cleaner programming meant an ease of maintenance amounting to one program for less than a day a month.

Controls are maintained among programs throughout the system, and summaries by provider and provider type are a natural by-product. This information allows anticipation of cash necessary by state officials.

Butkus served as systems director for Albany County's Department of Health during development and implementation of its Medicaid system. He is currently president of OG Enterprises, a consulting firm in the health care field.

The Q Terminal

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The stylish **Model 300-Q** adds a new dimension to Gen-Com's line of high quality 30 cps ASCII communications terminals. The **Model 300-Q** offers you many standard features such as: horizontal tab, vertical tab, margins control, proportional space mode, basic and super plot, 2741 Mode, 10/12 pitch and complete forms control!

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Societies/ User Groups

Glaser to Speak at DPMA Info/Expo 75

PARK RIDGE, Ill. – George Glaser, outgoing president of the American Federation of Information Processing Societies (Afips), will give advice on how to become a more effective DP manager at the opening day luncheon of Info/Expo 75.

The conference and exposition, sponsored by the Data Processing Management Association (DPMA), will be held June 29-July 2 in Atlanta.

Glaser will discuss the broad and often conflicting demands placed on the DP manager by senior management and the skills and attitudes required to function as the caretaker of complex machines and the intellects that run them.

There are 50 seminar sessions planned for the conference, keyed to the theme "Managing for Success," and 20 product/service orientation sessions.

A special feature will be three educational seminars devoted to mini and midi computers. "The growing number of mini and midi computer installations and increasing concern about computer cost-effectiveness justify a closer look at this extremely important area," a conference spokesman commented.

For further information, contact DPMA International, 505 Busse Highway, 60068.

ACM to Provide Interpreters For the Deaf at Annual Meetings

NEW YORK – The Association for Computing Machinery (ACM) Executive Committee has unanimously approved a plan which will make interpreting services for deaf people available at all future annual meetings.

With assistance from the Center on Deafness at the California State University in Northridge, the Special Interest Group on Computers and the Physically Handicapped (Sigcaph) initiated a pilot effort at ACM '74 in San Diego.

The service has now been put on a permanent basis.

To facilitate the necessary arrangements, hearing-impaired persons planning to attend ACM '75 in Minneapolis/St. Paul on Oct. 20-22 should contact Dr. Steven L. Jamison, ACM/Sigcaph Vice Chairman for the Deaf, 1501 California Ave., Palo Alto, Calif. 94303.

ACM Asks Entries In Chess Tourney

NEW YORK – The Association of Computing Machinery (ACM) is soliciting entries for its Sixth U.S. Computer Chess Championship, to be held as part of its 1975 Annual Conference Oct. 22-25 in Minneapolis.

A four-round, Swiss-style tournament is planned, and a special exhibition will be given by David Levy, an international master from England, who will take on all entrants simultaneously. The field is limited to 12 teams.

Last year Ribbit, a program written by Jim Parry, Ron Hansen and Russell Crook, captured the title by upsetting the champion since 1970, Chess 4.0, developed by David Slate and Larry Atkin of Northwestern University.

Entry forms can be obtained by writing to Monroe Newborn, Department of Electrical Engineering and Computer Science, Columbia University, New York, N.Y. 10027. The deadline for entries is Sept. 1.

IEEE Computer Society Member Contest Starts

LONG BEACH, Calif. -- Members of the IEEE Computer Society can compete for prizes worth over $2,300 in a contest to sign up new members.

The membership contest features four separate categories – one each for regular members and student members and two for chapters – with six different ways to win.

Prizes include two Sharp PC-1001 programmable calculators, a Texas Instruments SR-51 scientific calculator, two Texas Instruments SR-50 scientific calculators and two cash prizes to chapters of $250 each.

In addition to prizes awarded in the four contests for signing up new members, there will be two random drawings – one for all current members and one for new members joining before the contest closes on Oct. 31.

Entry blanks are available from the Computer Society Publications Office, 5855 Naples Plaza, Suite 301, 90803.

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Societies/ User Groups

Two of Four From IBM

DPers Elected to Engineering Academy

WASHINGTON, D.C. – Four specialists in computer science were among 86 American engineers recently elected to the National Academy of Engineering.

Those elected were Arthur G. Anderson of IBM for contributions and leadership in computer technology; Joseph K. Dillard of Westinghouse Electric Corp. for pioneering in applying digital computers to the technical and economic analysis of power generation and transmission systems; Gerald P. Dinneen of MIT for contributions to the design of digital computers and satellite communications systems; and Ralph E. Gomory of IBM for contributions to the fields of linear and integer programming and leadership in the development of computer technology.

The academy is a private organization established in 1964 to share the responsibilities of the National Academy of Science under a congressional charter of 1863.

Election to the academy is considered the highest professional distinction that can be conferred on an American engineer.

Calendar

June 3-5, Brighton, England – Telecommunications 75, a conference and exhibition devoted to user requirements. Contact Interco Business Consultants Ltd., Interco House, 8/10 Kew Foot Rd., Richmond, Surrey.

June 11-13, Pisa, Italy – **APL 75**, an international congress for those involved in a programming language. Contact: S. Trumpy, CNUCE, Via Santa Maria, 36, 56100.

June 11-13, Brussels – **European Computer Services Conference**, Contact: Computing Services Association, 109 Kingsway, London, England WC2B 6PU.

June 16-18, New York – **Developing Computer-Based Human Resource Management Systems**, sponsored by American Management Association (AMA). Contact: Alan Freedman, Program Director, AMA Building, 135 W. 50th St. New York, N.Y. 10020.

June 16-18, San Francisco – **International Conference on Communications (ICC '75)**. Contact: ICC '75, P.O. Box 77191, 94107.

June 16-18, Fort Worth, Texas – **1975 Conference on Computers in the Undergraduate Curricula**. Contact: A.A.J. Hoffman, Texas Christian University.

June 18-20, Paris – **1975 International Symposium on Fault-Tolerant Computing**. Contact: IEEE, P.O. Box 639, Silver Spring, Md. 20901.

June 25-27, Washington, D.C. – **"Federal Government Data Systems,"** a government-industry conference presented by the American Institute of Industrial Engineers (AIIE). Contact: AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

June 25-27, Bowling Green, Ohio – **Second Annual Conference on Computer Graphics and Interactive Techniques**. Contact: David L. Fulton, Department of Computer Science, Bowling Green State University, 43403.

ACM Picks Victor In Paper Contest

NEW YORK – A paper titled "Multiprocessing Compactifying Garbage Collection" by Guy L. Steele Jr. of Harvard University was chosen as the winner in the fourth annual George E. Forsythe Student Paper Competition for 1974-75, sponsored by the Association for Computing Machinery (ACM).

The ACM awarded Steele $200, a three-year subscription to the ACM serial publication of his choice and a trip to the 1975 ACM annual conference in Minneapolis/St. Paul to receive his award.

A tie for second prize was awarded to Jon L. Bentley of Stanford University for his entry, "Multi-Dimensional Binary Search Trees Used for Associative Searching," and R. Mark Claudson of Hanford High School in Richland, Washington, for "The Digital Simulation of River Plankton Population Dynamics."

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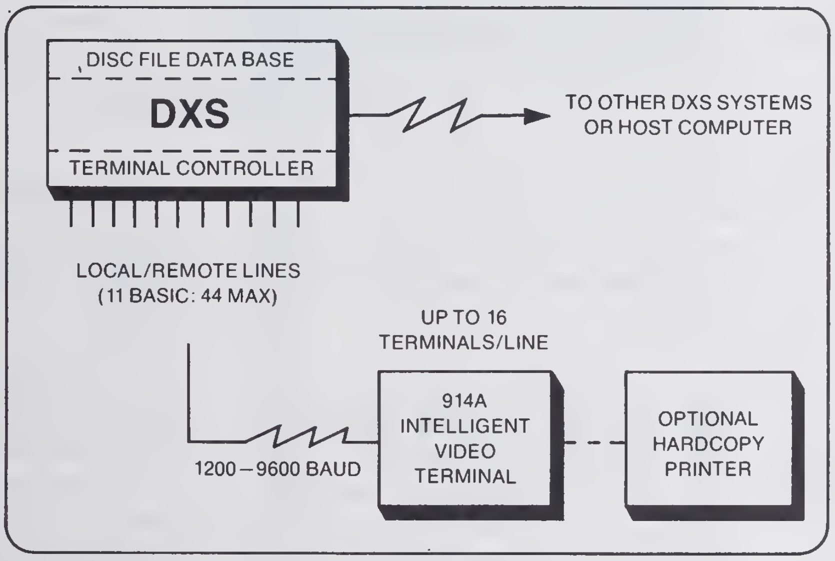
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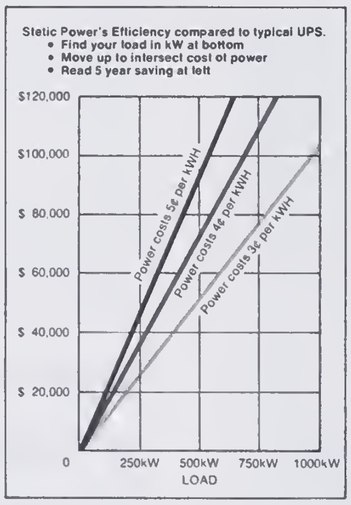

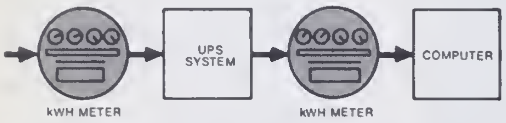

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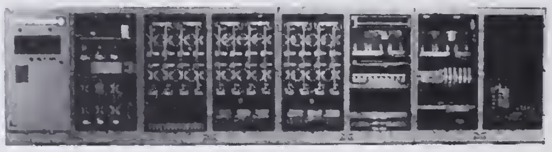

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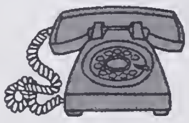

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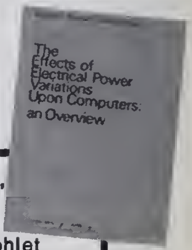
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Wrong Address Keyed In

Error Raises School's Budget $14,000

OCALA, Fla. – It took four years and $14,000 for the Marion County School Board to realize it was paying utility bills for the Southeastern Livestock Pavilion here.

Both the pavilion, under the direction of the Marion County Commission, and the school board are billed by the City of Ocala DP center. The error occurred when a keypunch operator keyed the Livestock Pavilion's account number with the address of Oakcrest Elementary School.

Since bills contain only the address and account number, but no building name, the school board thought the bill was correct and paid it, every month, for four years. The error was finally caught in March when the board's records were being audited.

Now the school board is demanding that the Marion County Commission pay it back, but the commission claims it can't because those budgetary years are closed.

Both agencies, however, are under the county budget, so as far as the DP center is concerned, the bills have been properly paid and it is up to the two agencies to work out the problem between themselves.

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System for Calculating Race Odds Doubles as Family Planning Tool

BANGKOK, Thailand – A computer-based progress study is helping to plot the effectiveness of Thailand's family planning program here.

Every afternoon, Cornelia Dellenbaugh, a Peace Corps volunteer and computer specialist, leaves raw data at the Bangkok Turf Club to be processed by a computer system which is used on race days to calculate betting odds and race payoffs.

Most of the studies performed under the auspices of the Division of Family Planning of the Thai Ministry of Public Health have concentrated on determining the acceptance rate of birth control devices, according to Carol Honsa, chief of the news bureau at the Office of Public Affairs of Action.

The statistics-gathering program is funded through the United Nations Fund for Population Activities and is the only family planning project using a computer in that capacity in Southeast Asia, Honsa said.

There is no reason at present to remove Dellenbaugh from Thailand because of the situation in Cambodia or South Vietnam, Honsa added.

Data on French Quarter Buildings Automated for Preservation Effort

NEW ORLEANS – Computers will be used in preservation efforts of French Quarter buildings under way here by the Vieux Carre Commission (VCC), supported with a $39,000 budget allocation.

The project includes all 3,078 area buildings and involves information gathered on 400 structures per year by staff of the VCC and Ohio-based Urban Data Systems, Inc. (UDS), which will also analyze the data, Richard S. Harrington, executive vice-president of UDS, said.

Project inventories include information on the original construction of each building and what changes have been made through the years, according to Wayne Collier, chairman of the VCC.

Copies of the UDS computer results will be sent to property owners and all city regulatory agencies, including the state fire marshall's office, Collier said.

Collier said the program is no "crackdown" on property owners, but rather an early warning effort to aid them in making needed repairs.

Analyses Detect Reading Problems

HOUSTON – Computer-generated analyses of tests given to elementary school students here are helping to detect and correct reading problems.

Recently, 2,500 children with reading problems were tested for 40 reading skills. A computer analysis of test scores was then conducted in Omaha by the Education Progress Corp., and copies of the computer printouts were given to parents and teachers.

This year's series of tests cost $14,000 in local funds; but testing the same number of students next year will cost only $4,000.

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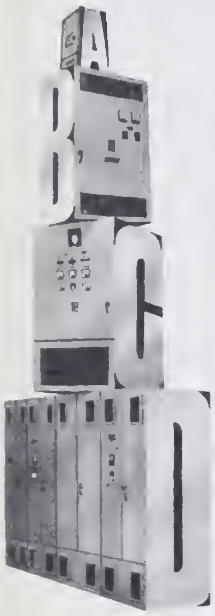

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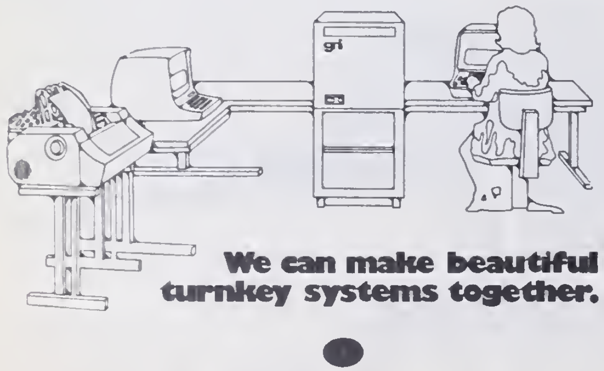

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Writing Analysis Studied For Air Force Security

BEDFORD, Mass. – Security experts at Hanscom Air Force Base here, with help from Veripen, Inc., are researching automatic handwriting verification as a means to control access to military facilities more effectively.

The Air Force has awarded Veripen a $236,000 contract to build an advanced development model of such a system to measure and convert handwriting characteristics to a digital format for storage in a low-cost minicomputer.

Until recently, most entry control systems relied on nonpersonal identification such as a coded card, knowledge of a code or a combination of the two. Truly effective security requires verification of the person, however, not the code.

"When you mention handwriting, most people think a good forger can probably 'fool' the system," said Capt. Gregory A. Cieciwa, project engineer at the Electronic System Division's Base and Installation Security Systems Program Office.

"But the Veripen approach is different. It uses a special ball point pen to measure the pressure with respect to time required for a person to sign his name."

Statistical evaluation has proved each person's "pressure pattern" is unique to the individual and even reasonably constant from one signature to the next. Since the technique measures pressure, only indirectly related to signature appearance, the pressure pattern of a forgery will appear different from that of the real signature.

Each pressure pattern is a distinct personal characteristic which is virtually impossible to duplicate and relatively easy to measure, according to Cieciwa.

Special Pen Used

To enroll in the system, a person taps out a previously assigned, four-digit identification number on a keyboard and then signs his name three times with the special ball point pen. The pen, which is wired to a 16K Interdata 716, measures the time and pressure used to form letters in the signature. These characteristics are then recorded with the identification number in the computer memory.

Once on file, a person authorized to enter a military installation need only tap out his number code and sign his name. Signals from the pen are transmitted via an uninterrupted double-shielded cable to the mini which compares the signature and code to the information on file for the individual and either approves or rejects the person for entry.

"We can expand the capability of the system to handle more individuals by adding disk memory units," added Cieciwa.

Time-Sharing System Helps Driver To Develop Sound Car Engineering

SEBRING, Fla. – A professional racing driver/designer has "salvaged fifth place out of a field of 43 starters" here recently in a race for Formula Super Vee cars by using computer capability to help develop sound car design.

Billy McConnell, a 23-year-old engineering graduate from Whitmore Lake, Mich., and his mechanic support team – ages 21 and 18 – had the only car in the 100-kilometer race designed with the help of computer systems.

Computer support is usually reserved for larger, more expensive cars than his Tui BH5, and for races with a larger purse, he commented.

McConnell used computer systems to aid in the engineering design of racing suspensions when he was an undergraduate at the University of Vermont (UVM).

"It got me an 'A' in the subject of my senior thesis and helped me set up one of the quickest Formula Fords on the Sports Car Club of America (SCCA) circuit," McConnell said.

Uses Time-Sharing System

While at UVM, he performed his computations on a CRT terminal which addressed the school's Xerox Sigma 6 system. Now out of college, he has access to a teletypewriter linked to a time-sharing computer system in California, McConnell said.

"I've got a certain elementary program with different variables of suspension spring rates, wheel tracks and sway bars and an initial design to work from. The computer tells me how the car would respond to the changes I've input.

"I enjoy fooling around with it and just hope it works. I've had a reasonable amount of luck with it so far," McConnell said, adding he looks at his preoccupation with Formula racers as relaxation after four years of college.

DP Added to Formula For Sports Success

BONN, W. Germany – Hours of training, endless stamina and the will to win has been the prescription for success in sports since time immemorial. But in Russia, data processing techniques have been added to that list.

Used for 15 Years

"For about 15 years, computers have been used in Soviet sports activities, not only for research work but in actual competition as well," according to a recent edition of the East German sports magazine, *Deutsches Sportecho.*

Computerized training and build-up has borne rich fruit for the Russians, especially in track and field events. But the techniques have also been applied to such subtle sports as figure skating and gymnastics with great success, the magazine said.

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CI Notes

Honeywell Picks Decision

HORSHAM, Pa. – Decision Data Corp. has received a contract from Honeywell Information Systems for the supply of 96-column card multifunction units and card reader mechanisms for Honeywell's 62/40 system.

Decision said it will also offer both its 80- and 96-column card data recorders directly to Honeywell users.

Ampex Nets Terabit Orders

REDWOOD CITY, Calif. – Ampex Corp. has received two orders for its Terabit Memory System (TBM).

At Computer Corp of America, the system will be interfaced to a Decsystem-10 via an IBM 360/370-compatible channel adapter.

A TBM will be installed at the National Center for Atmospheric Research to operate with a Control Data Corp. system.

The Terabit system uses videotape recording technologies to store and randomly access 5.6G bytes of data on a 10-1/2-in. reel of standard video tape.

ADR Sells T/S Business to Delos

PRINCETON, N.J. – Delos Computer Services, Inc. has agreed to acquire the time-sharing business of Applied Data Research, Inc. (ADR).

Under the terms of the sale, ADR will become one of the largest customers of Delos' U.S. time-sharing operation.

IBM Aids Refugee Relocation

BOSTON – IBM has donated $250,000 to the American Red Cross to assist in the relocation of Vietnamese refugees in America.

Supershorts

Mitrol, Inc. has selected National CSS, Inc. to sell and service its Mitrol Industrial Management System in the U.S. and UK.

– – –

Digital Equipment Corp. recently shipped 100 LA36 Decwriter II terminals to the University of Pittsburgh. DEC filled the order in less than three weeks.

– – –

Two-year-old Business Systems Technology, Inc. has installed its 700th core memory on an IBM System/3.

– – –

BASF will market California Computer Products, Inc.'s Automated Tape Library system in the UK.

– – –

Mohawk Data Sciences, Inc. plans to move its executive headquarters from Utica, N.Y. to Morristown, N.J. Remaining operations in Utica will be consolidated into company-owned Herkimer facilities.

To Reduce Dependence

Firms Moving to Finance Own Lease Bases

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Several independent suppliers of data entry and remote batch equipment are realizing a long-time goal of reducing their dependence on third-party lessors as a source of immediate cash and retaining a larger portion of their lease base.

The move is viewed by industry sources as a sign of the increasing maturity of that segment of the industry.

By retaining a larger portion of their lease bases, the firms are ensuring themselves of future revenues rather than one-time increases in revenues from sales.

Although a long-time goal of most firms, several previously have found this impossible to achieve. Their need for immediate cash forced them to sell certain percentages of their production to other parties, such as third-party lessors.

"Maybe there's some segment of the industry that's reaching a certain level of maturity at the same time," commented Richard Thompson, vice-president of marketing for Scan-Data Corp.

"For the long pull, it's a favorable thing if you can manage it cashwise, and it's an objective that all of us have.

"We deal for better or for worse in a lease rental world, thanks to our friends at IBM, and that has for the short term particularly onerous problems for the small outfit. But for the longer term, for the firm that gets over the hump and gets a good big rental base out there, it's great," he said.

Varying Approaches

Approaches to increasing a firm's lease base vary. Some firms are deciding to finance more of their own current production; others have elected to buy back portions of their lease base previously sold to third-party lessors.

Entrex, Inc., maker of key-to-disk equipment, has chosen the former method and is "continuing a trend begun some time ago, trying to maximize the lease paper we hold ourselves and to build in a definable projected stream of future revenues and earnings," R.S. Cheheyl, Entrex treasurer, explained.

One factor facilitating Entrex's move away from reliance on third-party lessors is that it does not have the pressures of a publicly held company, he said. Another was the procurement of a new line of credit last fall, he added.

"We need to finance the leased equipment, and we now feel we can do it," he said.

Cheheyl declined to give specifics on what percentage of Entrex's current production is being sold to third-party lessors.

Scan-Data Corp., which markets optical character recognition (OCR) units and a key-to-disk unit as well as a mixed media system, bought back its lease base from Alanthus.

Scan-Data continues to sell units to other leasing companies, but the repurchase "allows us to make a major start in building substantial month-to-month lease income, and we'll try to add to that from our future sales," Thompson said.

"To put it in a negative way, the only reason you sell off [your lease base] in the first place is to get advantage of the cash flow benefits.

"Given the opportunity and the wherewithall to get it back . . . I think most companies would proceed accordingly," he said.

Scan-Data put together financing combining some money up front borrowing from First Pennsylvania Bank and some payments from future rentals.

The volume of business Scan-Data does with leasing companies is determined by the firm's mix of outright sales generated by other sources, he said.

No Third-Party Sales Next Year

Computer Machinery Corp. (CMC) has embarked on a plan that calls for about $2 million or $3 million in sales to third-party lessors in 1975 and none for 1976, said Richard Plat, vice-president of finance.

Rather than being a conscious decision, the move began in 1974 when CMC had planned to sell about $11 million worth of equipment to third-party lessors, but sold only around $4 million.

The lessors ran into financing problems during the middle of the year, which in turn gave CMC some cash flow problems, he noted.

"One of the difficulties with third parties is you depend on their ability to get financing. It's much better to get financing directly yourself rather than being dependent on what might happen to other people's financing," he said.

CMC increased its domestic line of credit to $25 million from $17 million earlier this year to aid in the expanded role the company is playing in carrying its lease

(Continued on Page 60)

Honeywell Bull, CII Merger Set; Honeywell to Gain $60 Million

MINNEAPOLIS – Honeywell Bull and Compagnie Internationale pour l'Informatique (CII) have agreed in principle to merge the business computer interests of the two firms, Honeywell, Inc. said last week.

The move, which has been expected for some time, would net Honeywell, Inc. with $60 million and a minority interest in the new firm, to be called Compagnie Internationale pour l'Informatique Honeywell Bull.

Honeywell anticipates the merger will enable it to gain access "to substantial new markets, particularly in France," as well as French governmental support, Edson W. Spencer, Honeywell president, said.

Many details remain to be completed and final approvals obtained, but Spencer said he hopes contracts can be signed and operation of the new firm under way by early fall.

At present, the status of the new firm in Unidata, a European consortium of computer makers, is unclear. French officials have said they "will look into the possibility" of cooperating with CII's partners in Unidata, Siemens AG and N.V. Philips.

The parties have agreed to offer a unified worldwide computer product line marketed under the Honeywell and CII-Honeywell Bull labels, Spencer said, adding the firms will also share research and development and coordinate product requirements.

Honeywell Bull designs and manufactures the small-scale Level 61 and medium-scale Level 64 systems as well as peripherals. It also markets Honeywell products in much of Europe, Africa, South America and the Middle East.

The new company would have about 20,000 employees, with 15,000 from Honeywell Bull and 5,000 from CII, Honeywell said.

CII's plant in Toulouse, France, and its current minicomputer, military and communications business would not be included in the new company.

Under the plan, the new firm would be 53% owned by French interests and 47% by Honeywell Information Systems (HIS), which in turn is owned by Honeywell and General Electric Co.

Currently HIS owns 66% of Honeywell Bull, with Compagnie des Machines Bull the other owner.

A Honeywell spokesman said the chief French partners would be the French government, Compagnie Generale d'Electricite (which now owns 49% of CII) and Machines Bull. The role of Thompson Brandt, which currently holds 51% of CII, was not defined.

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RAYTHEON

Qantel Business Picking Up After Four Quiet Months

By Molly Upton

Of the CW Staff

NEWTON, Mass. – Qantel Corp.'s business is picking up again after about four months of dormancy, and is showing a positive cash flow, Douglas Baker, Qantel president, said in a recent interview here.

The introduction of the IBM System/32, Qantel's new product line and the economy are all factors in the more active climate, he said.

The small business machine market is "very price-sensitive," he said, noting Qantel's 800 and 900 with prices of $19,500 and $24,500 will increase orders for its older line, priced at a minimum of $31,000.

"They've given us a good entry," he said.

Baker added he hadn't thought the small business machine market was that sensitive to the recession, but found out differently.

Production is now running about 50% for the older line and 50% for the new, he said, and he expects it to stabilize at this point.

Organizational Changes

Qantel is changing its four branches into agencies this summer "to get out of the loop of building a national marketing organization," Baker said.

Qantel will continue to perform maintenance for its installed base and handle product manufacturing and research and development up to the point of sale.

In addition, Qantel has signed up several distributors in the U.S. recently for a total of 25, and it anticipates about 40 by the end of the year.

Baker admitted the firm's operating system had bombed, but noted "we got back as we always do." Qantel had to clean up the bugs between June, when installation started, and October, when things were straightened out.

"I didn't think I would make the same mistake twice but I did," Baker said, referring to a similar experience when he was at Basic Four.

From now on, Qantel systems will use the existing operating systems, he said.

Plans call for the introduction of a system five times faster than its current product line sometime this fall, featuring 128K.

Qantel is now using 4K chips, he said, noting they are so reliable they need very little testing, compared with the 1K chips which had a 25% to 30% reject rate.

Baker said industry rumors predict the introduction of a 16K chip by the end of the year.

'Hanging Tough'

Some small users are somewhat anti-IBM, as they want to know their supplier will work hard for them, he said.

"They know they got where they are by hanging tough" and want to see the same qualities in a supplier, he said.

With the recent influx of small business machines, the accounting machine market is "finished," he said. Anything with a magnetic strip will be dead, as a floppy disk is better, Baker observed.

The ingredients for success in the market are a data base, multiuser approach with a high-level operating system and vertical market packages, he said.

IBM's approach to vertical software packages is too rigid, he said, noting Qantel has designed its utilities to be modified and more flexible.

When a Qantel user upgrades a system, he receives the full list price of the box he turns in, he said. "This eliminates the used machine market which scares the hell out of me."

Firms Move to Expand Their Own Lease Bases

(Continued from Page 59)

base.

The firm has effectively kept title to about 50% of its total shipments over the years. "We never did have a policy of selling everything," Plat said.

This year Data 100 Corp. plans to operate without any sales to third-party lessors for the first time in its history.

Within the past two years the firm has repurchased Pepsico's share of its lease base.

Inforex, Inc. is also attempting to increase its own lease base, a spokesman said.

Currently the firm is considering an option to buy back part of its lease base, but it's partly a question of availability of cash and of profit impact, he observed.

During 1975 Inforex should receive less than 10% of total revenues from third-party sales, he said.

As a percentage of total revenues, sales to third parties have been generally decreasing.

During 1972, Inforex sold about $6.4 million worth of equipment to lessors, accounting for over 25% of revenues, and in 1973 the same amount was 17% of revenues.

In 1974 the firm went three quarters without any third-party sales and these totaled about $655,000, or less than 1% of revenues. This amounted to one-tenth the amount of third-party sales in 1973, the spokesman pointed out.

Sales to third parties are expensive in terms of the discount offered, since the third-parties assume risk of ownership, and the vendor loses future equity in the systems, he said.

Scan Optics, Inc., maker of OCR equipment, is now operating independently of sales to third-party lessors as a result of a series of transactions in a recapitalization plan.

In a somewhat complicated series of international dealings, Scan Optics in 1973 reacquired all of its lease base, 15 or 16 systems, held by Randolph Computer Co.

It then negotiated a trading transaction and sold the equipment to Mitsui & Co. Ltd. for cash, Jean Belhumeur, treasurer, said.

Scan Optics' wholly owned subsidiary, World Wide Systems, acquired the base from Mitsui for notes which are liquidated through the rental stream.

A $15 million line of credit from Mitsui enables Scan Optics to finance its own lease base, he said, explaining the transactions represented a change in Scan Optics' method of doing business, rather than a change in the method of accounting.

Although the base has been bought and sold several times, the firm has not accounted for it as a sale, he said.

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Data 100 Noncancelable Leases Mark Move From Third Parties

By Molly Upton
Of the CW Staff

MINNEAPOLIS – A key element in Data 100 Corp.'s plan to gain independence of third-party agreements in 1975 includes noncancelable leases to users that may be accounted for as sales, Bob Trimpey, vice-president and controller, said recently.

Data 100 anticipates no transactions to third parties under either recourse or nonrecourse arrangements during 1975, he said.

With the different strategy of financing and the ability of its marketing group to sell long-term leases, Data 100 is able to push aside the need for third-party lessors, he said, noting ownership of equipment will ensure continued growth from 1975 through 1980.

Data 100's long-term lease is 42 months.

Because Data 100's long-term leases, when discounted to their present value, exceed or equal the historical sales price of the equipment, they comply with the requirements set forth by the Accounting Principles Board and may be accounted for as sales.

This not only gives the firm working capital, but also enables it to keep ownership of the equipment and future revenues generated by it.

Last year Data 100 retained ownership of about 50% of its production and plans to expand to 70% in 1975, reflecting the effect of long-term leases. The remaining 30% will be in direct sales, Trimpey said.

Data 100 had long-term lease commitments from financial institutions for about $15 million in 1974 and will be increasing those lines significantly in 1975 and later, he added.

Efforts have been made in the past two years to keep third-party sales in line. Although revenues jumped 63% between 1973 and 1974, third-party financing was within about $1 million in that time period, he noted.

In efforts to expand its lease base, in 1973 Data 100 repurchased about $12 million of its equipment from Pepsico, which it had sold originally under a recourse arrangement.

Under this type of transaction, if the equipment comes off rent, Data 100 substitutes another unit on rent or repurchases that system.

During 1974, Data 100 entered into nonrecourse agreements valued at about $16 million. These transactions may be treated as sales at the end of the recovery period, Trimpey said.

After the lessor has recovered his initial cash investment plus return, the lessor and the manufacturer split up the remaining revenues, he said.

Under Data 100's long-term lease plan, financial institutions discount the future proceeds of the lease and pay cash for continued rental flow. "This gives us cash flow, a lease recorded as a sale and full ownership of equipment," Trimpey said.

The ability to get long-term leases that can be accounted for as a sale is a key, he said.

IBM Lets Army Go Freely

WHITE PLAINS, N.Y. – IBM said it has agreed to let the Army cancel an order for three remaining 360/65s on a contract for nine systems without imposing penalties of about $9.6 million.

The move leaves the Army free to procure these three systems through the General Service Administration on a competitive basis.

Because of a price drop, the government will be able to procure them at about $1.7 million, the "current going price," rather than the $2.7 million under the IBM contract, said Rep. Jack Brooks (D-Texas), chairman of the House Government Operations Committee.

$6 Million Over Current Prices

This means the Army is paying about $6 million over current market prices for the six 65s it has installed, observers noted.

The price drop occurred because of "dynamics in the market" rather than any change in production costs, an IBM spokesman noted.

Originally, the contract awarded to IBM in a competitive procurement in 1967 called for up to 24 systems with a total value of about $70 million, including systems engineering services and education, the IBM spokesman said.

The agreement was modified in 1972-73 to call for nine systems with a total value of $28 million, the spokesman continued.

The amended contract has been under discussion for over a year because only the General Services Administration is authorized to buy DP equipment for the government.

The Army has acknowledged a procedural error in the amended contract.

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Acquisitions

ADP Acquires Cyphernetics

CLIFTON, N.J. – Automatic Data Processing, Inc. (ADP) has signed a contract for the acquisition of The Cyphernetics Corp.

The acquisition is expected to be completed before June 30, pending receipt of necessary approval, and will be accounted for on a pooling-of-interests basis.

Other Acquisitions

Applied Devices Corp. has acquired more than 51% of the outstanding shares of Datatrol, Inc. and an option to increase ownership to 80%. The purchase was for an undisclosed amount of cash.

Ball Corp. has acquired substantially all of the assets of Allied Computer Systems, Inc., developer of the Readoc mail remittance processing computer system.

Dynamic Information Systems, Inc. has acquired Porokem, Inc. and Electro-Optical Mechanisms, Inc.

Martin Marietta Data Systems, Inc. has acquired the British firm, Hoskyns Group, Ltd.

Systems Engineering Corp. has acquired Old Dominion Microfilm Laboratories.

Broomall Industries, Inc. has acquired the Graphic Plotter line of equipment of Electronic Associates, Inc. (EAI), including worldwide marketing and manufacturing rights. EAI will continue to sell and service these products for Broomall. Broomall will supply EAI with all future OEM requirements for analog and digital plotters to complement its computer line.

Keane Associates, Inc. has acquired Innovations in Technology, Inc. for an undisclosed amount of cash and notes.

Acquisition of Decision by Ball Speeds Up Product Development

By Molly Upton
Of the CW Staff

OAKLAND, Calif. – Products are in the works at Ball Computer Products, Inc., formerly Decision, Inc., maker of OCR and mark readers as well as disk controllers.

Decision's acquisition last August by Ball Corp. is enabling the firm to bring to market some of its development ideas, said Rick Dove, director of marketing.

In explaining the acquisition, Dove said, "Ball is very interested in building a $100 million computer complex within its organization. We are very interested in pursuing all of the development expertise we have here that requires large amounts of cash, like OCR," he added.

"We really had to slow down the OCR development because of cash requirements. Now we can take some of these products off the shelf and bring them to the marketplace."

Expanded Product Line

Three new products are planned in the mini area, two of them involving equipment compatible with Interdata units, he said.

Ball has expanded its line of disk controllers to include units compatible with Interdata machines as well as Data General machines, he explained.

There will also be new OCR readers which will be faster than its current offering, he said.

To prepare for the expanded product line, the high volume manufacture of mark readers is being transferred to the parent company's Boulder facility, he said.

The plant here has also assumed manufacture of the Readoc remittance processing system developed by Allied Computer Systems, Inc., which was also acquired by Ball.

By 1976, the Readoc unit will incorporate an OCR reader made by Ball Computer Products, Dove said.

Currently Ball is making about three OCR readers a month and anticipates revenues of $7 million to $10 million in calendar 1975 with $3.5 million in 1974.

International Markets

"A fair amount" of production is headed for international markets, primarily Japan, he said, and Ball is starting a marketing thrust in Europe.

Most of the growth will come from internal sources, although some will come from the acquisition, he said.

But along with plans for revenue growth are specific plans to be a profitable firm, he emphasized.

One of the firm's main thrusts recently has been in the area of support. Ball has tripled its field support staff within recent months and is still hiring.

"We've heard complaints in the minicomputer industry that, generally speaking, everyone loves the equipment they get and they hate the support. So we're going to answer that head on by really providing that support to the industry," Dove said.

Ball is contemplating selling its OCR reader to the end user. A time frame for such activity has not been set since one of the prerequisites is the ability to service the units in various locations.

'Management Development' Topic of Adapso Seminar

MONTVALE, N.J. – In an effort to assist industry members in gaining better control of management problems, the Association of Data Processing Service Organizations, Inc. (Adapso) will hold Management Development seminars in two locations this spring.

The first will be held at the Sea Lodge, La Jolla, Calif., May 20-22. The second is scheduled for the Royal Coach of Atlanta in Georgia June 3-5.

Dr. Donald W. Devine will conduct both seminars.

Study Topics

Included for study during the three-day program are techniques of increasing human performance within the business environment, work adjustment, leadership as well as followship and social and emotional behavior of individuals during business conflict.

Also to be covered are self analysis, joint problem solving and techniques in the helping relationship.

Fee for Adapso members is $345 and for nonmembers, $375. Adapso is at 210 Summit Ave., 07645.

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Adapso Gives Hart Legislation For Consolidating Antitrust Suits

By Edith Holmes
Of the CW Staff

MONTVALE, N.J. – At the request of Sen. Philip A. Hart (D-Mich.) and his Subcommittee on Antitrust and Monopoly, the Association of Data Processing Service Organizations (Adapso) has submitted a proposal for legislation that would consolidate antitrust litigation within an industry in one federal district court.

Limited to amending the present definition of jurisdiction for such cases found in Title 28, U.S. Code, Section 1407 of the antitrust laws, Adapso's efforts are an outgrowth of its observation of the inconsistencies and duplication of effort in the numerous actions against IBM, J.L. Dreyer, executive vice-president for the organization, said.

"In cases where the defendant and one or more questions of fact are in common, we suggest that the same court preside," Dreyer stated.

"The legislation we have drafted for consideration by Sen. Hart's subcommittee wouldn't bind parties to this consolidation, but would simply provide them with an opportunity to coordinate their efforts," he explained.

Separate Treatment

Cases would continue to be treated separately, and both plaintiff and defendant would have to accept trial by the central court as opposed to handling the case on the basis of local jurisdiction, he indicated.

"There would be an opportunity for a history of handling these cases in the context of a particular industry to develop," Dreyer said.

DP Adds Millions To Trade Surplus

WASHINGTON, D.C. – Foreign trade figures released recently by the U.S. Department of Commerce show a $1.38 billion trade surplus for the month of March, due in part to a $16 million increase in the sale of computers and parts.

For the first quarter of 1975, foreign sales of computers and spare parts brought in $543 million, compared with $502 million in the year-ago period.

Second-quarter DP sales in 1974 totaled $567 million, with third and fourth quarters showing $562 million and $572 million respectively.

Major factors contributing to the surplus were a drop in U.S. consumers' purchase of foreign goods and a drop in oil imports after the increased tariff on imported oil went into effect Feb. 1.

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Big Cybers Get Ready

Control Data Corp.'s largest models in the Cyber 170 series, the Cyber 175s, are in the final test and check-out stage at CDC's plant in Arden Hills, Minn. The systems are said to operate up to twice the speed in mainframes half the size of those offered previously by CDC. First deliveries are scheduled in July.

Nippon Firm Forms Subsidiary To Sell American Gear in Japan

By Nancy French
Of the CW Staff

WELLESLEY, Mass. – A Japanese trading company has formed a subsidiary here to market American-made computer products in Japan and other Far East nations.

Known as Martec International Corp., the firm is a subsidiary of the $20 billion Marubeni Corp. of Tokyo, one of the three largest trading companies in Japan.

Martec will serve as the middle man, linking American manufacturers with Japanese distributors to facilitate the flow of American computer products into the Japanese market, a market that is growing at an estimated 30% per year.

Martec, according to its president, Ralph Zani, will assume the entire responsibility for marketing, spare parts and training of sales representatives, service personnel and also customers in Japan through its principal distributor, Tokyo-based Marubeni Electronics.

In addition to direct marketing assistance, Martec will also take on the function of continuing research into American technology and products as well as Japanese market needs and trends to more efficiently bridge the gap between manufacturer and user, according to Zani.

Martec, an outgrowth of Marubeni Electronics, was established by the parent company in 1971 to specialize in the growing trade and use of electronic components and products. In four years, the company has grown from $5 million to $30 million in sales.

Martec is already exporting turnkey systems and programmable terminals for Entrex, teleprinters and CRTs for Teletype, line printers for Data Products, tape and disk drives for Wangco and computer-aided design equipment for Applicon, Zani said.

M. Noda, Martec vice-president and secretary, is a Japanese citizen who has been associated with Marubeni Corp. in Tokyo for more than 10 years.

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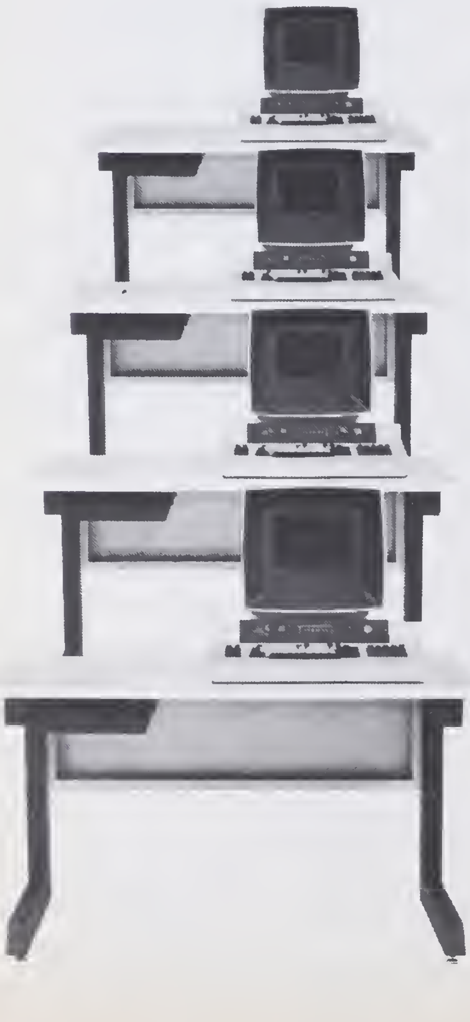

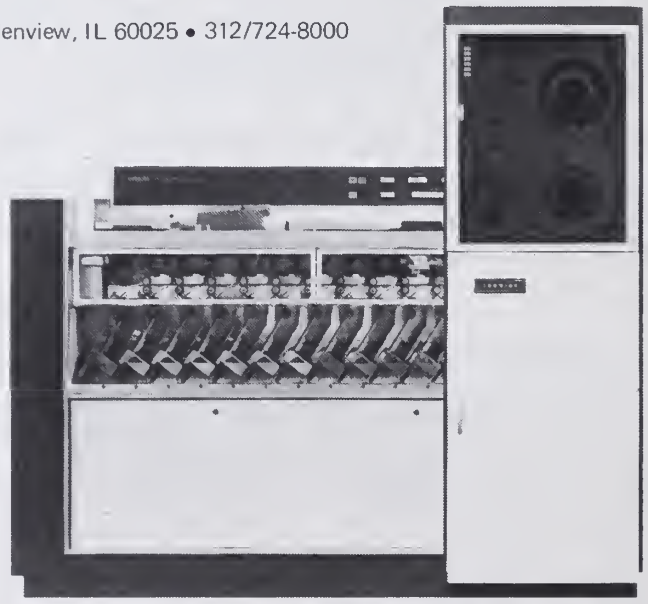

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Orders & Installations

Ga. Insurance Company Installing 130 Sycor 340s

ATLANTA – Life Insurance Co. of Georgia has ordered 130 Sycor, Inc. Model 340 intelligent terminals and matrix printers for use in a field debit accounting operation.

The system is expected to be fully operational by the first quarter of 1977 and the firm hopes to have 30 units operational by the end of this year.

Other Orders and Installations

Meijer, Inc. has ordered 219 NCR 255 retail terminals and 11 NCR 726 minicomputers and tape handlers for installation in three existing stores and one scheduled to open later this year.

The Armed Forces Staff College has installed two 23.5M-byte disk units and a line printer from Hewlett-Packard to expand its present 32-terminal HP 2000F time-sharing system.

The Howard Johnson Co. has installed a reservations system from Raytheon Data Systems consisting of 70 PTS-100 terminals, three Model 1020 processors and four printers.

Guaranty Bank & Trust Co. of Worcester, Mass., is installing an NCR Century 201 and 251 to administer its central information file and to act as the nucleus of an on-line system of 120 teller terminals.

North Central Airlines has ordered about $400,000 in Incoterm terminal systems and services, including 96 operator positions using the SPD 20/20 intelligent computer terminals and 27 SPD-P100 printers.

A frozen food processing firm, Rich Products, has ordered a Univac 90/60 system.

Standard Oil of Indiana (Amoco) has ordered three CC-70/80 communications processing systems from Computer Communications, Inc.

Pioneer Standard, Inc. has ordered a Univac 90/30 for a new management information system at the firm's headquarters.

The British Are Coming

WASHINGTON, D.C. – The British are coming – with a traveling exhibit of 11 software firms.

After an exhibit at the British Embassy here May 25-28, the group will be in Los Angeles at the British Consulate General May 29-June 3 and the British Trade Development Office in New York June 4-6.

Many of the firms represented are seeking association with U.S. firms for possible joint venture operations in the European Common Market and other countries, a spokesman said.

With emphasis on application packages, the firms' offerings range from personnel and payroll to freight forwarding to real-time systems.

Members of the tour, sponsored by the Computing Services Association and the British Overseas Trade Board, include Applied Computing and Software Ltd., Computer Aid for Management Ltd., Computer Systems International Ltd. and Leasco Software Ltd.

Still others participating are: Management Dynamics Software Services, Management Systems and Programming Ltd., Mouncey and Partners Ltd. and Overseas Computer Consultants Ltd.

Peterborough Data Processing Services Ltd. and Software Implementation Ltd. complete the group of firms on the tour.

IDC Newsletter Informs DPers On Eastern Bloc Nations' Mart

MUNICH – Want more insight into the vagaries and opportunities of trading with the Eastern bloc nations? International Data Corp.'s (IDC) *EDP East-West Report*, a biweekly newsletter, is designed to keep DPers up-to-date in this area.

The first few issues traced existing legislation between the USSR and other Eastern bloc nations and outlined products likely to be in demand. Details were also given on exhibiting at Interorgtekhnika-75, to be held in Moscow Sept. 2-16.

Under guidelines issued by the Office of Export Administration, the following equipment is likely to be approved for exhibit and subsequent sale in the USSR: general-purpose minicomputers without programmable read-only memories, computers up to 15M bytes (in 370/145 class) if they do not have more than six of the 2314-type disk drives, disk drives not exceeding the 2314-type, impact line printers, paper-tape and punched-card equipment, alphanumeric-only CRTs with transmission speed at or below 4,800 bit/sec and tape drives up to 1,600 bit/sec and 75 in./sec.

Equipment not likely to be approved includes: specialized minis optimized for interactive dialogue in applications such as computer-aided design of air frames, integrated circuits, systems appropriate for analyzing electromagnetic emissions and computers larger than the 370/145.

Disk drives above the 2314-type such as 3330 or 3340 are also likely to not receive approval as are full-graphic display terminals; terminals transmitting faster than 4,800 bit/sec; computer output microfilm (COM) equipment that displays and records graphics; and OEM sales of core stacks, memory modules, read/write heads and other similar equipment.

Subscription to the EDP East-West Report is $149/year or DM 350 from IDC at 214 Third Ave., Waltham, Mass. 02154 or IDC-Eastern Europe Regional Office, 8000 Munich 40, Tristanstrasse 11, W. Germany.

Brandon Expanding Operations in Europe With Center for ICL Program Conversions

FELTHAM, England – Brandon Applied Systems, Inc. is expanding its European operations with the establishment of a center here to provide system transformation services.

The center, which will include three ICL Model 2970s, will convert programs from one environment, machine or language to the ICL 2900 series.

Tools Converted

Brandon's tools, developed for use on an IBM 370/158 operated in San Francisco, will be converted to operate on the ICL machine.

Brandon's System Transformation Services are marketed in the UK by BIS-Brandon, Ltd.

"The establishment of this major facility, encouraged by ICL, opens up an important opportunity for the application of our technology in Europe. We look forward to the day when the market for our services in Europe will exceed that of the U.S.," said Dick H. Brandon, chairman of Brandon Applied Systems, Inc.

Siemens Opens MOS Components Plant

MUNICH, W. Germany – Siemens has established a plant here to produce MOS components, a move that consolidates its previous efforts.

Siemens anticipates the plant, which cost about $8.4 million, will generate revenues of $42 million a year and make it the leading MOS manufacturer in Europe.

MOS sales are expected to increase at 30% over the next few years, the firm said, noting in 1974 the worldwide MOS market exceeded $840 million.

Siemens is making MOS circuits with p-channel metal-gate technology and memories with p-channel silicon gates.

An n-channel process with silicon gate is being introduced and it expects further progress on silicon-on-sapphire technology, which it calls epitaxial silicon films on insulators.

Aussies Widening Rules for Suppliers

SYDNEY, Aust. – The Department of Manufacturing Industry is investigating a broader approach to the requirement that DP suppliers to the federal government here include some native-made components.

The department is considering including the cost of local maintenance and repair facilities. Currently firms gaining government contracts must utilize local subcontracting or reciprocal purchases, according to an article in *Pacific Computer Weekly*.

The government is polling suppliers to learn the extent of such facilities. The department is considering operations that include clean room work for the repair of major items.

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Immediate openings exist now for Programmers, Analysts, Lead Computer Operators, as well as other systems/programming and operational positions.

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NATIONAL BANK OF ALASKA

Experienced EDP Analyst/Programmers, compute the advantages of working at Aramco.

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Analyst/Programmer — Payroll: To participate in the development and maintenance of major applications in payroll, as well as tax and benefits programs. A college degree is required. Three years COBOL or PL/1 experience in commercial programming, preferably in payroll systems.

Analyst/Programmer — Information Systems: To participate in the development of information systems. A college degree plus a minimum of three years COBOL and/or PL/1 programming experience is required. IMS application experience would be useful.

Analyst/Programmer — Engineering: Responsibilities include the development and programming of applications in the engineering and scientific areas. A degree in Engineering (preferably Electrical) or Physical Science is required, and a minimum of three years of FORTRAN or PL/1 experience is desired.

Systems Programmers: Responsibilities include the generation and maintenance of the operating system, and the evaluation, installation, and support of software products, and technical support for application Analysts/Programmers. Aramco also has a requirement for Analysts with experience in IMS internals, including error analysis. Three years EDP experience including one year of OS/360-370 programming, is necessary. A degree in Computer Science, Physical Science, Engineering, or Mathematics will fulfill the educational requirement.

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Atlanta, Chicago, Los Angeles, Minneapolis, Rochelle Park, N.J., Boston, Dallas, Philadelphia, St. Louis, Washington, D.C., Cincinnati

SYSTEMS ENGINEERS

Four-Phase Systems, the California-based computer manufacturer responsible for the development of the industry's first all LSI computer with solid state memory, has immediate openings for marketing oriented individuals in the above locations.

The position requires a strong BAL background and communications experience. COBOL and previous vendor experience will be helpful.

Four-Phase Systems Engineers attend a comprehensive eight-week training program. Upon completion of this course, they are responsible for sales assistance, customer education, software maintenance and system design.

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To arrange for a personal interview, send your resume and salary history to:

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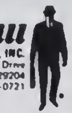

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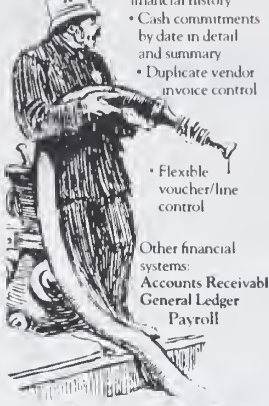

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Mohawk Loss Increases; Quarter Results Improved

UTICA, N.Y. – Although the nine-month loss increased at Mohawk Data Sciences Corp. (MDS), results from operations during the third quarter were improved over those from the preceding second quarter.

For the nine months, MDS lost $9.2 million compared with a $4.2 million loss in the same period last year. Almost $4 million of the 1974 loss stemmed from increased interest costs and expenses for relocation of a manufacturing facility.

Interest costs rose to $13.8 million from nearly $11 million last year and relocating the Atron operation, which supplies CPUs, from St. Paul, Minn., to Utica and Herkimer, N.Y., showed as a $1.2 million charge. The move was part of overall corporate consolidation.

In addition, the loss from discontinued operations increased to $668,000 from $349,000 in the nine-month period last year.

This covered a service bureau, Data Transcription, Inc.; an ink-roller operation, H.M. Storm; and a sintered metal operation, a spokesman said.

Rental and service revenues grew to $80.7 million compared with $72.5 million, more than compensating for the reduction in sales to $44.9 million compared with $53.1 million in the year-ago period.

During the third quarter, the firm lost nearly $1.9 million down sharply from the $4.1 million loss in the previous second quarter.

Revenue from continuing operations during the third quarter rose to $3.4 million compared with $1.4 million in the preceding quarter.

Also, interest expenses, although increased in the nine months, were $400,000 less in the third quarter than in the second, principally because of the drop in the prime rate.

The firm will establish reserves during the fourth quarter to cover the closing of plants in Bohemia, N.Y., and King of Prussia, Pa., and relocating of some product lines in Herkimer, he said.

Three-Month Net Up at Scan-Data

NORRISTOWN, Pa. – Scan-Data Corp. reported a 30% rise in revenues and earnings in the first quarter ended March 31.

Earnings reached $39,757 or 2 cents a share compared with $30,636 or 2 cents a share in the year-ago period. The figures include tax credits of $9,000 and $8,205 respectively.

Revenues rose to $2.5 million compared with $1.9 million in the first period last year.

Scan-Data's key-to-disk system, which it buys from Pertec Corp., and its mixed-media system have enabled the firm to offer a more diversified product line, said Richard Thompson, vice-president of marketing. The firm also has three OCR service bureaus.

Scan-Data had a "surprisingly good first year" with the key-to-disk system, and the trend is still very good, he said.

OCR is growing, but not as rapidly, he noted, adding that, whereas the firm's key-to-disk base started from zero, there is a larger installed base of OCR systems.

Scan-Data has seven or eight mixed-media systems installed, which offer both key-to-disk and OCR capabilities, he said.

Thompson sees mixed-media as a "very important lever for the long pull in making OCR more acceptable. I don't see any massive rush to buy mixed media. I think there's a lot of interest in the concept, but I think the sales are still coming relatively slow."

In the long run, Thompson said, "the bloom is going to come off the key-to-disk lily, and I think mixed media is the logical next step."

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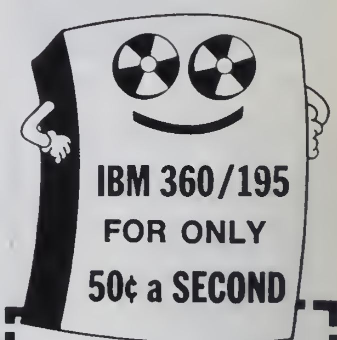

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	1975 (000)	1974 (000)
Shr Ernd	$.59	$.51
Revenue	478,887	387,253
Earnings	14,297	12,054

SYCOR
Three Months Ended March 31

	1975	1974
Shr Ernd	$.44	$.31
Revenue	11,195,900	9,343,100
Tax Cred	382,000	335,000
Earnings	1,216,700	853,000

PENRIL
Six Months Ended Jan. 31

	1975	1974
Shr Ernd	$.22	$.13
Revenue	2,315,390	1,940,329
Spec Cred	136,406	72,690
Earnings	292,256	164,980

MODULAR COMPUTER SYSTEMS
Three Months Ended March 31

	1975	1974
Shr Ernd	$.19	$.21
Revenue	8,672,000	4,956,000
Tax Cred	.....	188,000
Earnings	548,000	591,000

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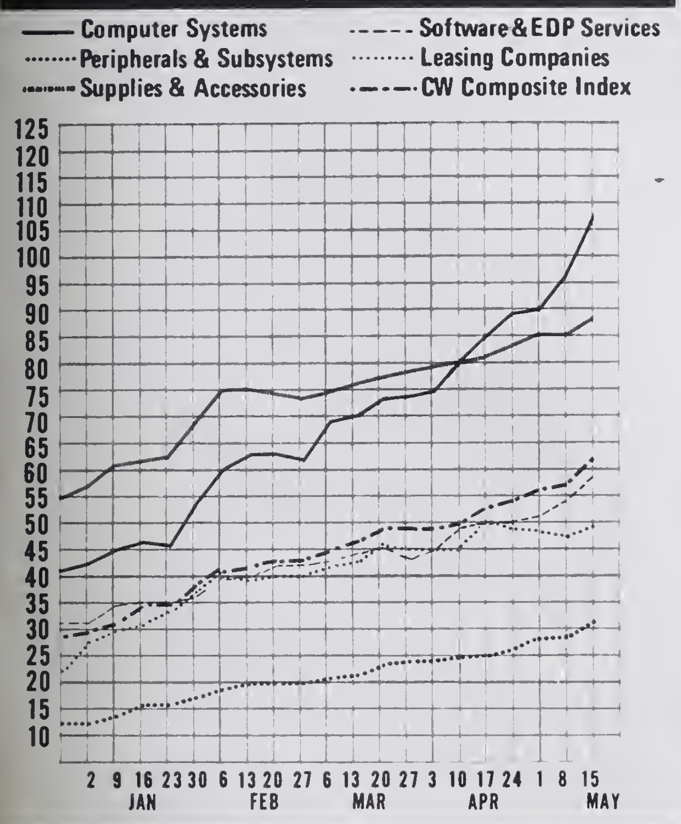

INCOTERM
Year Ended Feb. 22

	1975	1974
Shr Ernd	$.12	$.92
Revenue	21,404,000	16,584,000
Tax Cred	175,000	541,000
Earnings	325,219	1,607,418
3 Mo Shr	.36	.04
Revenue	7,408,000	4,392,000
Spec Item	a175,000	b(27,000)
Earnings	623,000	76,000

a-Tax credit. b-Reversal of tax-loss carryforward.

MICRODATA
Three Months Ended Feb. 28

	1975	a1974
Shr Ernd	$.12	$.17
Revenue	3,417,502	3,182,538
Tax Cred	18,000	127,800
Earnings	193,664	269,998
6 Mo Shr	.03	.29
Revenue	6,859,237	5,718,247
Tax Cred	18,000	206,800
Earnings	45,959	454,011

a-Restated.

NASHUA
Three Months Ended March 28

	1975	a1974
Shr Ernd	$.33	$.60
Revenue	74,279,000	71,295,000
Spec Cred	b1,366,000	.....
Earnings	1,541,000	2,773,000

a-Restated to reflect change of Lifo method of inventory evaluation. b-Cumulative effect on prior years of an accounting change for investment tax credit.

NATIONAL CSS
Year Ended Feb. 28

	1975	a1974
Shr Ernd	$1.67	$1.91
Revenue	32,609,612	23,700,501
Tax Cred	.....	519,900
Earnings	1,828,662	2,101,950
3 Mo Shr	.41	.52
Revenue	7,904,978	6,763,407
Tax Cred	.....	129,975
Earnings	447,132	582,666

a-Restated.

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Three Months Ended March 28

	1975	1974
Shr Ernd	.....	$.47
Revenue	$4,202,793	4,176,932
Spec Cred	.....	a1,339,913
Earnings	(80,847)	1,199,637
9 Mo Rev	13,233,426	10,094,050
Spec Cred	.....	a1,339,913
Loss	289,157	3,575,839

a-Gain from sale of land.

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TRADE*QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 14, 1975

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1974 RANGE (1)	CLOSE MAY 14 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	107 3/8	+7 1/2	+7.5
O	COMPUTER AUTOMATION	2- 14	8	+1 7/8	+30.6
N	CONTROL DATA CORP	10- 38	23	+3 1/4	+16.4
N	DATA GENERAL CORP	10- 38	30 3/4	0	0.0
O	DATAPOINT CORP	5- 18	18 1/4	+ 1/4	+1.3
O	DIGITAL COMP CONTROL	1- 5	3	+1	+50.0
N	DIGITAL EQUIPMENT	46-121	110	+4 1/8	+3.8
N	ELECTRONIC ASSOC.	1- 3	2 3/4	+ 1/8	+4.7
A	ELECTRONIC ENGINEER.	4- 11	9 1/8	+ 1/2	+5.7
N	FOXBORO	19- 48	36 7/8	+3 1/4	+9.6
O	GENERAL AUTOMATION	6- 40	10 1/8	+2	+24.6
O	GPI COMPUTER CORP	1- 2	1 1/8	+ 1/2	+80.0
N	HEWLETT-PACKARD CO	54-109	106 5/8	+ 7/8	+0.8
N	HONEYWELL INC	18- 86	33 5/8	+3 1/8	+10.2
N	IBM	152-251	223 1/2	+11 1/8	+5.2
O	MEMOREX	2- 10	6 3/4	-2 7/8	-29.8
O	MICRODATA CORP	1- 5	4	+ 1/8	+3.2
O	MODULAR COMPUTER SYS	5- 16	15 1/2	+1 3/4	+12.7
N	NCR	14- 40	36 3/4	+3 3/4	+11.3
N	PERKIN-ELMER	15- 40	27	0	0.0
N	RAYTHEON CO	21- 46	45 1/2	+2	+4.5
N	SINGER COMPANY	10- 16	15 1/8	+1 1/8	+8.0
N	SPERRY RAND	24- 47	46 1/2	+2 5/8	+5.9
A	SYSTEMS ENG. LABS	1- 4	3 1/4	- 3/8	-10.3
O	ULTIMACC SYSTEMS INC	1- 4	5 3/4	+ 5/8	+12.1
N	VARIAN ASSOCIATES	6- 13	11 1/4	+ 7/8	+8.4
N	WANG LABS.	7- 20	14 5/8	+2 1/8	+17.0
N	XEROX CORP	50-127	86 1/4	+5 1/4	+6.4

LEASING COMPANIES

EXCH		PRICE 1974 RANGE (1)	CLOSE MAY 14 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 7	4 1/2	+ 1/2	+12.5
A	COMMERCE GROUP CORP	2- 6	3	+ 1/8	+4.3
A	COMPUTER INVSTRS GRP	0- 4	7/8	0	0.0
M	DATRONIC RENTAL	1- 1	5/8	0	0.0
A	DCL INC	0- 1	3/8	0	0.0
N	DPF INC	2- 5	4 7/8	+ 3/8	+8.3
O	EDP RESOURCES	2- 3	2	0	0.0
A	GRANITE MGT	1- 5	4 1/4	+ 1/8	+3.0
A	GREYHOUND COMPUTER	2- 6	3	0	0.0
A	ITEL	3- 7	6 1/4	0	0.0
N	LEASCO CORP	4- 12	5 5/8	+ 5/8	+12.5
O	LEASPAC CORP	1- 2	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 5	2 1/2	+ 1/4	+11.1
A	PIONEER TEX CORP	2- 10	4	+ 3/4	+23.0
A	ROCKWOOD COMPUTER	1- 1	5/8	0	0.0
N	U.S. LEASING	5- 24	11	+ 1/4	+2.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1974 RANGE (1)	CLOSE MAY 14 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/8	0	0.0
A	APPLIED DATA RES.	1- 10	2 3/8	0	0.0
N	AUTOMATIC DATA PROC	21- 59	59	+3 5/8	+6.5
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 6	3 1/4	0	0.0
O	COMPUTER DIMENSIONS	1- 5	5	+ 3/4	+17.6
O	COMP ELECTION SYSTMS	3- 5	5 1/8	+ 7/8	+20.5
O	COMPUTER HORIZONS	1- 5	1 1/8	0	0.0
O	COMPUTER NETWORK	1- 2	2 1/8	+ 1/4	+13.3
N	COMPUTER SCIENCES	2- 5	4 5/8	+ 1/2	+12.1
O	COMPUTER TASK GROUP	1- 1	3/4	+ 1/8	+20.0
O	COMPUTER USAGE	2- 4	2 7/8	0	0.0
O	COMSHARE	2- 4	3 7/8	- 1/8	-3.1
O	DATATAB	1- 3	1 1/8	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	27 1/4	+6 1/2	+31.3
O	INFONATIONAL INC	1- 2	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KEANE ASSOCIATES	2- 4	3 1/4	0	0.0
O	KEYDATA CORP	1- 6	2 1/4	- 1/4	-10.0
O	LOGICON	2- 5	5	- 1/8	-2.4
A	MANAGEMENT DATA	1- 2	1 3/4	0	0.0
O	NATIONAL CSS INC	5- 37	13	+4 1/2	+52.9
O	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
A	ON LINE SYSTEMS INC	9- 30	10 5/8	+ 3/8	+3.6
N	PLANNING RESEARCH	2- 5	4 1/4	+ 1/2	+13.3
O	PROGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	1- 5	4 1/4	+1 5/8	+61.9
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1/4	0	0.0
O	TYMSHARE INC	5- 16	15 7/8	+2 3/4	+20.9
O	UNITED DATA CENTER	2- 4	2 7/8	0	0.0
A	URS SYSTEMS	2- 4	2 3/4	0	0.0
N	WYLY CORP	1- 5	3	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1974 RANGE (1)	CLOSE MAY 14 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	3- 11	8 1/2	+1	+13.3
O	ADVANCED MEMORY SYS	1- 7	3 7/8	- 1/8	-3.1
N	AMPEX CORP	2- 6	5 1/2	+ 7/8	+18.9
O	ANDERSON JACOBSON	1- 4	2 3/4	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 7	5 1/4	+2	+61.5
A	BOLT,BERANEK & NEW	5- 9	6 7/8	+ 1/4	+3.7
N	BUNKER-RAMO	3- 8	6 3/8	+ 5/8	+10.8
A	CALCOMP	4- 11	5 3/4	+ 3/8	+6.9
O	CAMBRIDGE MEMORIES	3- 16	5 1/4	+ 1/2	+10.5
N	CENTRONICS DATA COMP	7- 23	16 7/8	+ 7/8	+5.4
O	CODEX CORP	8- 36	35 1/2	+7	+24.5
O	COGNITRONICS	1- 2	1 3/8	+ 1/4	+22.2
O	COMPUTER COMMUN.	1- 2	5/8	+ 1/8	+25.0
O	COMPUTER CONSOLES	2- 7	6	+1 3/4	+41.1
A	COMPUTER EQUIPMENT	1- 2	1 1/2	0	0.0
O	COMPUTER MACHINERY	1- 5	1 3/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	1 3/8	0	0.0
O	COMTEN	1- 5	4 3/8	+1 1/8	+34.6
N	CONRAC CORP	10- 22	19 1/4	+ 3/4	+4.0
O	DATA ACCESS SYSTEMS	2- 3	2	0	0.0
O	DATA 100	4- 16	15 3/4	+1 1/4	+8.6
A	DATA PRODUCTS CORP	2- 5	4 1/2	+ 1/4	+5.8
O	DATA TECHNOLOGY	1- 4	1 5/8	+ 1/8	+8.3
O	DATUM INC	1- 4	1	0	0.0
O	DECISION DATA COMPUT	3- 13	5 3/4	+ 1/2	+9.5
O	DELTA DATA SYSTEMS	1- 2	1/4	0	0.0
O	DI/AN CONTROLS	1- 2	1 1/8	- 1/8	-10.0
N	ELECTRONIC M & M	1- 4	2 1/4	+ 1/4	+12.5
O	FABRI-TEK	1- 3	1 1/4	0	0.0
O	GENERAL COMPUTER SYS	1- 4	2	+ 3/8	+23.0
N	HAZELTINE CORP	2- 7	3 5/8	+ 3/4	+26.0
N	HARRIS CORP	13- 34	20 1/8	- 3/8	-1.8
A	INCOTERM CORP	1- 7	6 1/2	- 1/8	-1.8
O	INFOREX INC	1- 5	4 1/8	+ 1/8	+3.1
O	INFORMATION INTL INC	6- 14	10 1/4	- 1/4	-2.3
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	6- 18	18 1/4	+1 3/4	+10.6
N	MOHAWK DATA SCI	1- 5	3	- 3/4	-20.0
O	OPTICAL SCANNING	2- 6	2 3/4	+ 1/4	+10.0
O	PERTEC CORP	1- 8	6 7/8	0	0.0
A	POTTER INSTRUMENT	1- 5	1 3/4	0	0.0
O	PRECISION INST.	1- 3	3/8	0	0.0
O	QUANTOR CORP	2- 8	3 1/2	+ 1/4	+7.6
O	RECOGNITION EQUIP	2- 5	4 1/2	0	0.0
N	SANDERS ASSOCIATES	2- 8	6 5/8	+ 1/4	+3.9
O	SCAN DATA	1- 3	2 1/2	- 1/8	-4.7
O	STORAGE TECHNOLOGY	6- 15	12 1/2	- 1/4	-1.9
O	SYCOR INC	4- 14	12	+2	+20.0
O	TALLY CORP.	1- 4	3 1/2	0	0.0
O	TEC INC	1- 7	2 1/4	0	0.0
N	TEKTRONIX INC	19- 48	36 1/8	+1	+2.8
N	TELEX	1- 4	2 3/8	+ 1/2	+26.6
O	WANGCO INC	3- 13	6 1/8	+1 7/8	+44.1
O	WILTEK INC	1- 8	3	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1974 RANGE (1)	CLOSE MAY 14 1975	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	4- 6	5 1/4	0	0.0
A	BARRY WRIGHT	4- 7	5 5/8	0	0.0
O	CYBERMATICS INC	1- 2	3/4	+ 1/4	+50.0
A	DATA DOCUMENTS	23- 54	39 5/8	+2 3/8	+6.3
O	DUPLEX PRODUCTS INC	6- 25	23	+ 1/2	+2.2
N	ENNIS BUS. FORMS	4- 7	6 1/2	+ 3/8	+6.1
O	GRAHAM MAGNETICS	5- 11	7 3/4	+ 1/2	+6.8
O	GRAPHIC CONTROLS	6- 17	15 1/4	+ 1/4	+1.6
N	3M COMPANY	43- 79	66 1/4	+1 3/8	+2.1
O	MOORE CORP LTD	33- 57	48	+ 1/4	+0.5
N	NASHUA CORP	15- 45	21 1/8	+1 7/8	+9.7
O	REYNOLDS & REYNOLD	6- 35	23	0	0.0
O	STANDARD REGISTER	10- 18	17	0	0.0
O	TAB PRODUCTS CO	4- 11	6 1/2	- 1/4	-3.7
N	UARCO	13- 24	22 5/8	+ 3/8	+1.6
O	VANIER GRAPHICS CORP	3- 7	6 1/2	- 1/2	-7.1
A	WABASH MAGNETICS	3- 7	4 1/8	+ 1/8	+3.1
N	WALLACE BUS FORMS	14- 25	21	- 1/4	-1.1

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